Volume 76 Number 7 July 2008

# Amateur Radio

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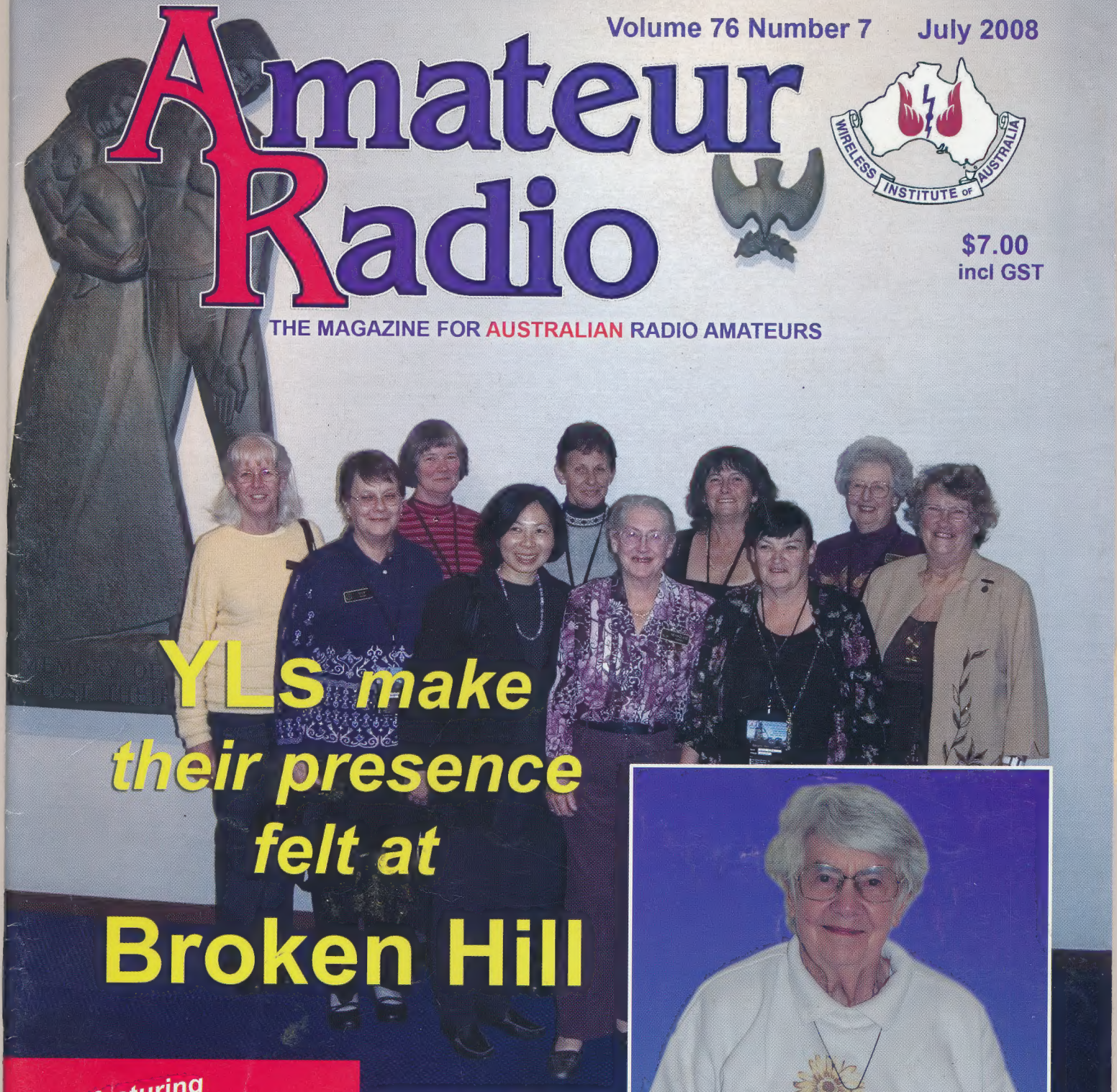

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# Amateur Radio

Volume 76, Number 7
July 2008

*The Journal of the Wireless Institute of Australia*

ISSN 0002-6859



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## Our Cover this month

**ALARA was well represented at the WIA AGM in Broken Hill. The backdrop to the group, photographed at the AGM Dinner, is a sculpture that recognises the sacrifice of those from Broken Hill and district in war, located in the foyer of the Broken Hill Entertainment Centre. L-R Lesley VK5HLS, Dot VK3DB, Jeanne VK5JQ, Susie VK5FSUE, Lia VK3LPH, Marilyn VK3DMS, Kathi VK6KTS, Jenny VK5FJAY, Meg VK5YG, and Christine VK5CTY. The inset shows Brenda Edmonds VK3KT with her certificate for the Ron Wilkinson Achievement Award. Photos by Peter Freeman VK3KAI.**

### Contributions to Amateur Radio

Amateur Radio is a forum for WIA members' amateur radio experiments, experiences opinions and news. Manuscripts with drawings and/or photos are always welcome and will be considered for publication. Articles on disc or email are especially welcome. The WIA cannot be responsible for loss or damage to any material. A pamphlet, 'How to write for Amateur Radio' is available from the National Office on receipt of a stamped self-addressed envelope.

### Back Issues

Back issues are available directly from the WIA National Office (until stocks are exhausted), at $8.00 each (including postage within Australia) to members.

### Photostat copies

When back issues are no longer available, photocopies of articles are available to members at $2.50 each (plus an additional $2 for each additional issue in which the article appears).

### Disclaimer

The opinions expressed in this publication do not necessarily reflect the official view of the WIA and the WIA cannot be held responsible for incorrect information published.

## Amateur Radio Service

A radiocommunication service for the purpose of self-training, intercommunication and technical investigation carried out by amateurs; that is, by duly authorised persons interested in radio technique solely with a personal aim and without pecuniary interest.

## Wireless Institute of Australia

The world's first and oldest National Radio Society
Founded 1910

Representing

***The Australian Amateur Radio Service***

***Member of the***
***International Amateur Radio Union***

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# Editorial Comment

**Peter Freeman VK3KAI**

Here we are in July already – half the year has already passed. For me, there will be an all too brief small reduction in pressure at work before the start of the second half of the year.

## WIA AGM

It was good to see so many people in Broken Hill for the WIA AGM in late May. It was a very long drive from Churchill, which was fortunately broken up in both directions by overnight stays with other amateurs.

On the trip to the AGM, Barry VK3BJM had offered a bed. It was great to catch up, even if only for a couple of hours on the Thursday evening before adopting horizontal polarisation. A brief chat over coffee in the morning allowed a quick look over the shack before hitting the road again.

In Broken Hill, there were lots of people to meet and many others with whom to renew contact. I even managed a little time to play some VHF radio – see the VHF/UHF column for an outline.

The return trip involved a "short" three-hour drive to Mildura, arriving early enough to drop into one winery to sample some of the produce. Then it was to the home of Geoff VK3ACZ and Marilyn VK3DMS for dinner and more discussion, enlivened by the presence of Christine VK5CTY, who was to spend a few days in Mildura. The next morning saw us back on the road for the trip home – fortunately an easy trip with few traffic hold ups resulted in only 8.5 hours travel time.

The atmosphere was excellent at all the WIA organised events. We have a photo essay in the centre pages showing some of the visual highlights.

## Drawings in AR

Some time ago, I made a call for assistance in the production of drawings for production in AR. Indications are that we have a volunteer to assist Bill VK3BR in the production of circuit diagrams, using one of the standard electronic design packages.

However, many of the drawings required do not work well unless prepared using a true CAD drafting package, for example TurboCAD, AutoCAD or similar packages. Most of the non-circuit diagrams are prepared using such a package. Are you a reader with skills in the use of such a package, who can prepare a drawing in your spare time on the odd occasion? If so, let me know and Bill will send you a sample task. Like so many of the jobs undertaken for the WIA, this too will be a volunteer task – giving you a chance to give a little back to our hobby.

## Callbook and AR cover photos

Thanks to those that have sent photos for consideration for the 2009 Callbook cover and/or for AR. We do need a greater selection of photos to be available, so that we can prepare covers of sufficient quality. Digital images are best; at as high a resolution as you can produce. Feel free to send the images at lower size and resolution, but remember to let us know the file size of the original to assist us in assessing whether the image/s will be usable for the required task.

## AR articles

Articles for consideration for publication in AR have been coming in slowly over the past couple of months – so much so that the technical editors have reduced the list for review to almost empty. Our thanks go to all who have contributed to date. We will soon be in need of new material – so please put fingers to keyboard and tell us all about the latest project in the shack, or even about the last club event. Remember that there are hints available on the WIA website – look under Members, AR magazine, Contributing material.

Did you venture out for the inaugural Winter VHF/UHF Field Day? If so, let us all know how it went for you and do not forget the photos.

By the time this magazine arrives in your mail box, it will be time for GippsTech2008. Once again, I look forward to catching up with so many amateur friends at the event. Of course, I will be on the look out to find someone to prepare a report for the August issue!

Cheers,

**Peter VK3KAI**

**Michael Owen VK3KI**
President WIA

# A simple question?

If you go to the WIA website and click on the button "About the WIA" you will find a button "Contact the WIA" and then you can select to whom you send your message – including the President.

Recently I received a question from an amateur through the WIA website as follows:

*Just a quick query on why Australian amateurs have restrictions on bandwith in the 160 and 80 metres sections. Looking at band plans for IARU region 3 shows 160 metres as 1800 kHz up to 2000 kHz and 80 metres as 3500 kHz up to 3900 kHz. Is this restriction placed on us by the ACMA and why?*

I am afraid that it is one of those deceptively simple questions. I could just say "Yes" and "Because it is how a sharing problem was solved" but that would be neither very helpful nor very meaningful.

So I have decided to answer part of it rather fully here, as the answer may be of general interest. I am going to answer it in terms of the 3500 kHz to 3900 kHz band only, as the principles are the same for both bands.

It all starts with the International Telecommunications Union, the ITU. Australia is a signatory to the ITU Constitution and Convention, and so is bound by the Radio Regulations, revised at World Radiocommunication Conferences every four years or so.

Article 5 of the ITU Radio Regulations lists the frequency bands allocated to the various services according to three geographic regions.

Article 5 shows that in Region 3, the Asia Pacific region, the band 3500 to 3900 kHz is allocated to 3 co-primary services, Amateur, Fixed and Mobile.

So there is the answer to your first question, the IARU Region 3 band plan covers the whole of the band available for an administration to allocate to the amateur service.

But it is important to recall that the ITU table does not actually allocate the bands in a country. The administration of a country does that. The term "administration" is an ITU term, and means the governmental department or service in a country "responsible for meeting the country's obligations under the ITU Constitution".

The sharing on a primary basis between Amateur, Fixed and Mobile in the band 3500 kHz to 3900 kHz in the ITU international table has been unchanged since 1959.

But how does Australia implement its allocation of frequency bands to services?

Since the Radiocommunications Act has been the primary Australian legislation, the responsible agency, now ACMA, must prepare and publish the Australian Radiofrequency Spectrum Plan (ARSP) which sets out in broad terms the services to which frequency bands are allocated in Australia. A copy of the ARSP can be found on the WIA website under Members Services\ Legislation.

In the words of the ARSP, the Australian allocations are "broadly aligned with the ITU requirements". That is because the Radio Regulations themselves allow variations from the international table if stations transmitting outside the table do not cause harmful interference to stations in another country operating in accordance with the international table.

Going back to 1959, Australia decided to solve the sharing problem by separating amateur and fixed and mobile, with the latter services using bands on a shared basis.

The WIA, after 1959, was concerned that the Australian band upper limit was below the US phone band and so sought an allocation above the US lower phone band limit of 3700 kHz. Initially, in 1984, a 6 kHz slot at 3794 kHz was given to amateurs on a non-interference basis, but in 2004 amateurs were given the primary allocation in the band from 3776 kHz to 3800 kHz.

Today the Australian Radiofrequency Plan's Table of Frequency Allocations shows the band 3500 kHz to 3700 kHz is allocated to Amateur, with no sharing with any other service, 3700 kHz to 3776 kHz allocated to Fixed and Mobile as co-primary, and the band 3776 kHz to 3800 kHz allocated to Amateur without any sharing, and the band 3800 kHz to 3900 kHz allocated to Fixed and Mobile, again as co-primary services.

But that is still not the end of the matter. The Plan is only a broad allocation of spectrum. The amateur must finally look at the Radiocommunications Licence Conditions (Amateur Licence) Determination No. 1 of 1997, generally referred to as the Amateur LCD and which is the formal title of the compilation of the Determination incorporating all the changes made to it since it was created in 1997.

That shows that the permitted frequencies and emission modes for an amateur Advanced station include the frequency bands 3.500 MHz to 3.700 MHz and 3.776 MHz to 3.800 MHz. An amateur Standard station and an amateur Foundation station can use the band 3.500 MHz to 3.700 MHz (but not the band 3.776 MHz to 3.800 MHz), with the Foundation station subject to the power, equipment and emission modes set out in the LCD.

So, while the international table has not changed since 1959, the Australian administration has solved the sharing problem by allocating separating bands to the Amateur service, with shared bands to the Fixed and Mobile services but also, in 2004, recognised and met a need for a higher segment.

So, it all goes back a very long way, and to find the precise allocations you must finally look in the Amateur LCD.

And that all shows, too, why the WIA is so anxious to ensure that we participate in the preparation for each ITU World Radiocommunication Conference and to have an amateur as a member of the Australian delegation to each WRC.

That is where it all starts.

**ar**

# WIA News

## Two letter call ballot

In April the WIA published a paper setting out the process that was proposed for it to conduct a ballot on behalf of the ACMA to provide a means for the equitable allocation of available amateur callsigns with two letter suffixes (two letter callsigns).

The paper sought comments and proposed a time table for the future conduct of the ballot.

As a part of the process, ACMA agreed to the WIA's request to review the cases of amateurs who had "lost" their two letter callsigns since 19 October 2005 as a result of their failure to renew their apparatus licence on time and who could show that their failure to renew was due to exceptional circumstances.

All amateurs who applied for a review were able to show exceptional circumstances, and so were successful and their callsigns have been returned to them.

However, a number of contractual, taxation and other issues have emerged in the discussions between the ACMA and the WIA in respect of the conduct of the ballot, and these complex issues have made the adherence to the original timetable impossible.

It now appears that the timetable originally proposed will slip by at least two months.

The WIA will advise all amateurs of the steps to be taken by those wishing to participate in the ballot, and the timing, just as soon as it has resolved the currently outstanding issues.

## AGM resolves to change WIA Constitution

The Annual General Meeting conducted at the Broken Hill Entertainment Centre at Broken Hill on 24 May 2008 had to consider two special resolutions proposed by the Board, one to correct a drafting error, the other more significant, to remove the requirement for a proposer and seconder for a person wishing to join the WIA.

The need for a proposer and seconder followed the previous Divisional constitutions and was now considered by the Board to be inappropriate for a national organisation and a barrier to entry, particularly for people in remote areas.

The special resolution also removed the requirement for a signature from a person wanting to become a member, a requirement that had prevented the WIA from having a true on-line method of becoming a member.

It was proposed that the Constitution say that the Board can prescribe the application for membership form, or accept a different form.

The special resolutions were convincingly passed, both on the vote of those present who were unanimously in favour and those voting by proxy, with only one proxy vote against the changes.

New members can now join the WIA using the new application form to be found on the WIA website, currently with a phone call to the office but shortly with a secure on line payment facility.

## VK2DQ new WIA Director

The Annual General Meeting conducted at the Broken Hill Entertainment Centre at Broken Hill on 24 May 2008 was the last official meeting for Trevor Quick VK5ATQ, who retired after being a director of the WIA since its restructure in May 2004.

The meeting thanked Trevor for his contribution to the WIA.

The meeting welcomed Ron Bertrand VK2DQ, who took office as a new director of the WIA at the conclusion of the AGM.

The Vice President of NZART Stuart Watchman ZL2TW and NZART Councillor Vaughan Henderson ZL1TCG represented NZART at the AGM and over the weekend.

## WIA makes news headlines in Broken Hill

The WIA AGM and weekend of activities made front page headlines in The Barrier Miner, a local Broken Hill newspaper.

The feature article which appeared on the front page of the newspaper talks of how amateur radio "has come a long way since the early days when Alf Traeger revolutionised communications in the outback with his pedal radio" and goes on to talk about the various activities our members will be participating in over the weekend. The article also acknowledged that through the changes to regulations for amateur licensing and with the introduction of the Foundation licence that "this has encouraged many more people to take up the hobby and numbers have grown significantly".

WIA director, Robert Broomhead appeared on "Outback Outlook", the ABC Radio 2NB Broken Hill morning show.

## China Earthquake

Fan Bin BA1RB, on behalf of CRSA, reported via IARU R3 Disaster Communications Committee Chairman Jim Linton VK3PC that as the disaster recovery efforts continue following China's most powerful earthquake, the Information Office of the State Council reported (on 26 May) that the death toll had reached 65,080.

Government officials and news media have recognised that when communications failed after the Sichuan earthquake on 12 May, it was amateur radio operators who stepped in to provide vital links.

In the past two weeks there has been more than five million people made homeless. The most in-demand materials and supplies for the disaster area are tents and medicines. Disease prevention is also at a very critical stage.

China Central Television (CCTV) reported on 26 May, "When all other communication means failed, amateur radio operators came out!" An amateur radio emergency communication network was setup and one of the commanders, Liu Hu called for amateur radio operators on air to provide services for disaster relief.

Thankfully, one main repeater survived during the earthquake. This repeater provided 100 km coverage to Mianyang. Amateur radio operators from Chengdu, Shenzhen, He'nan went to the centre of the disaster area, set up repeaters in Beichuan County, and provided various valuable first hand information from the centre.

The IARU radio society, CRSA say that it hoped to report later more detailed information on the role of amateur radio emergency communications in the earthquake.

# Triangle of six metre dipoles

Neville Chivers VK2YO

**One morning last October, I came outside and looked up at my antennas, to see the reflector of my six metre beam at an angle of 45 degrees to the driven element and swinging in the wind. When lowered to the ground, the aluminium of both the boom and the elements showed severe corrosion from the salt-laden sea breeze.**

I consulted the local TV antenna installer, who said I was lucky to get twelve year's service from the beam, as five to eight years was about normal around Kingscliff, and he noted that he only installs anodised aluminium antennas as a defence against the salt.

With the six metre season already late opening at this QTH, what to do, I asked myself? By the time I sourced the anodised material and built the beam it would be Christmas, and the season would be half over!

So I put up a six metre dipole running east/west, which gave broadside coverage north/south up and down the coast, with good contacts into VK3, VK4, VK5 and VK7. But I received weak reports from VK6, ZL and the Pacific islands, when other stations just to the north of me, in south east VK4, were getting and giving much better signal reports.

So, after scrounging some material to make another mast, a dipole running north/south took care of the signals from east and west. Then a third dipole, forming the hypotenuse of the triangle, takes care of signals from VK8 (if any), ZL and JA.

The only real problem was the time it took to change the coax connection at the back of the transceiver from one dipole to another, and in my experience the use of a coax switch at 50 MHz is not to be recommended. So I made use of a large electrical junction box on hand from a previous work life.

I mounted a coax socket on one end of the box, as the input from the transceiver, and three coax sockets on one side for the dipoles to connect to. Three banana plug sockets on the other end were individually wired to the centre pins of the dipole sockets. Then a banana plug on a wander lead from the centre pin of the input coax socket completes the circuit, for a quick change between dipoles – only on receive of course, unless you happen to like RF burns!

My box was metal, so an insulating grommet was used in the wall where the wander lead passed through. If a plastic box is used, no grommet would be required but a bonding strap connecting the bodies of all four coax sockets certainly would be.

Figure 1 shows the antenna layout. The only question that may be of concern if you want to build this antenna configuration is what to tie the dipoles to? Well, anything that is convenient is the answer. For instance, one corner of the triangle could attach to the barge board or chimney (if you actually have one) of your house, and the other masts could be something as simple as six metre lengths of water pipe, set one metre into the ground.

The purists will note that the dipoles are fed with 50 ohm coax when, in theory, their input impedances are approximate 72 ohms in free space; not easily achieved at five metres above ground – mine measured 63 ohms at the feed point. So, the VSWR is less than 1.5 at resonance. Anything less than this is acceptable with modern solid-state transceivers because their protection circuits activate above this level to automatically decrease output from the final amplifier transistors.

The purists will also tell you that the coax should have a balun between the balanced dipole and the unbalanced coax, or the radiation may be skewed. Quite right, too! But the extra weight makes the dipole sag, which again may skew the radiation pattern, and unless the balun provides the correct ratio between the feedline and the dipole impedance then a mismatch will occur, with a higher resultant VSWR.

The trick when connecting coax directly to a dipole is to shorten, by 5%, that side of the dipole which is connected to the braid.

I am a believer in applying the law of diminishing returns when necessary.

**ar**

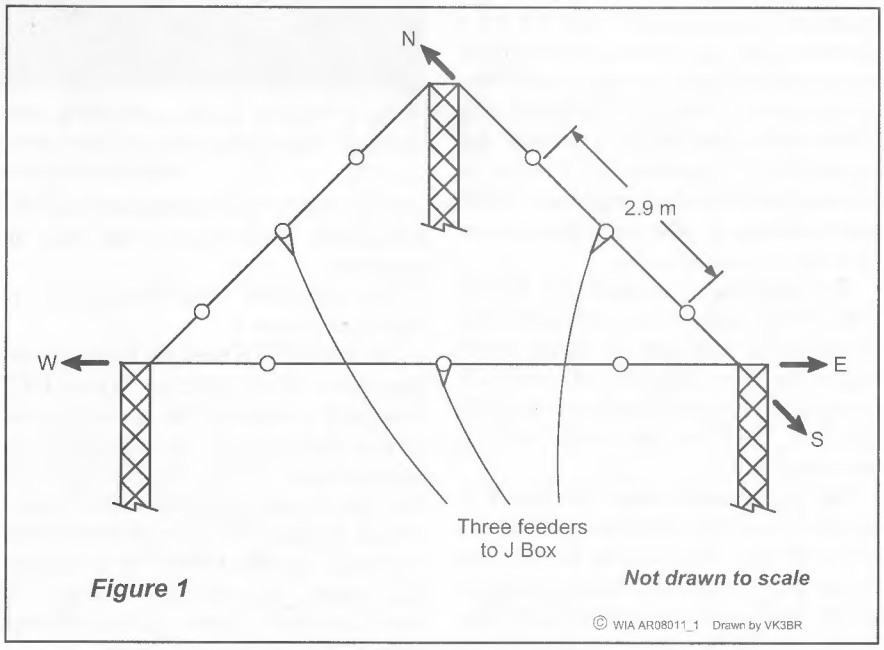


Figure 1. Triangular arrangement of six metre dipoles

## *Now for something completely different*

## Part 1

# A high power class-E amplifier for 40 metres

Phil Wait VK2DKN

**The June 2007 edition of AR featured a 160 metre, 35 watt, Class-E, AM/CW transmitter by Drew Diamond VK3XU, comprising a buffered crystal oscillator driving a single amplitude modulated MOSFET. Drew's circuit is an ideal project for those wanting to get into home brew AM.**

My first transmitter, almost 40 years ago, was a two valve home-brew 40 metre AM rig using whatever parts I could scrounge, extort or borrow at the time. All these years later, the allure of home-brew AM has never really left, so in an attempt to exorcise it I thought I would have a go at building a 40 metre rig again, but something up with the times, and something, well.... dramatic.

The theory of class-E operation is very well covered in various websites including Steve Cloutier's (WA1QIX) site at www.class-e.com, and an article by Nathan O. Sokal WA1HQC in the Jan/Feb 2001 edition of QEX.

This amplifier circuit, developed by Floyd Koontz WA2WVL, uses MOSFETs connected in a balanced push-pull arrangement and fed by a current mode input circuit. Floyd has successfully built several amplifiers using up to 10 MOSFETS producing 1500 watts power output. I chose to use six MOSFETS capable of 750 watts, or more: at the Australian legal limit of 120 watts average or 400 watts peak power on AM it is loafing along.

The amplifier is suitable for RTTY, CW, DRM, high level modulated AM, or any other analogue or digital mode where the drive signal is not amplitude modulated. The amplifier is not suitable for SSB, DSB, or low level (exciter) generated AM.

The greatest advantage of Class-E is its efficiency. This amplifier runs above 80% efficient - far superior to any class A/AB/B or C amplifier, and at Australian power levels does not require any heat sinking other than the aluminium base plate and chassis. If driven to higher power levels for extended periods, a heatsink, or at least a fan, may be necessary.

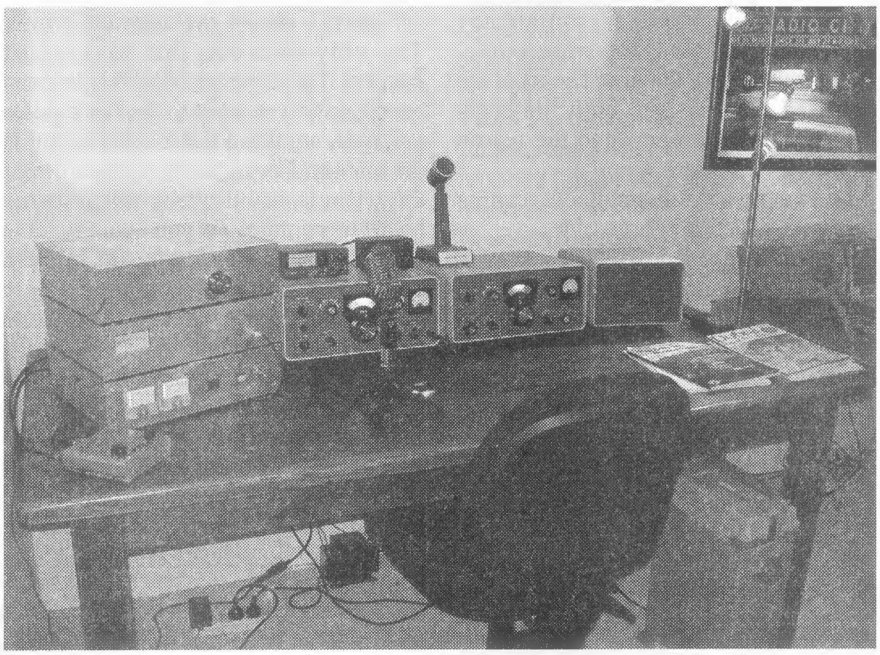

Photo 1: The AM station at VK2DKN. The Class-E transmitter, Class-D modulator and power supply are on the left. The small box to the far left is the Behringer MIC100 valve microphone pre-amplifier/limiter.

The complete amplifier circuit is shown in Figure 1.

The MOSFETS used are International Rectifier IRFP22N50A HEXFETS designed primarily for switch mode power supply/high speed switching applications. These MOSFETS have the following characteristics: drain-source voltage 500 V; maximum drain current 22 A; drain-source on-resistance 0.23 ohms; and total gate charge 120 nano-coulombs. Other similar or better MOSFETS will probably work.

Each set of three MOSFETs is driven in anti-phase to each other by reversing the primary windings between each set of three input baluns. The drain outputs are combined in a large home made ferrite balun transformer. This balanced arrangement produces less second harmonic distortion than a single ended design, and the output filtering requirements are therefore less onerous. In order to reduce drive requirements the gates are biased at about +3 V by a diode string.

The amplifier can be driven from any source delivering at least 20 watts average/RMS power; however it seems quite insensitive to higher drive levels. I was a little worried about connecting

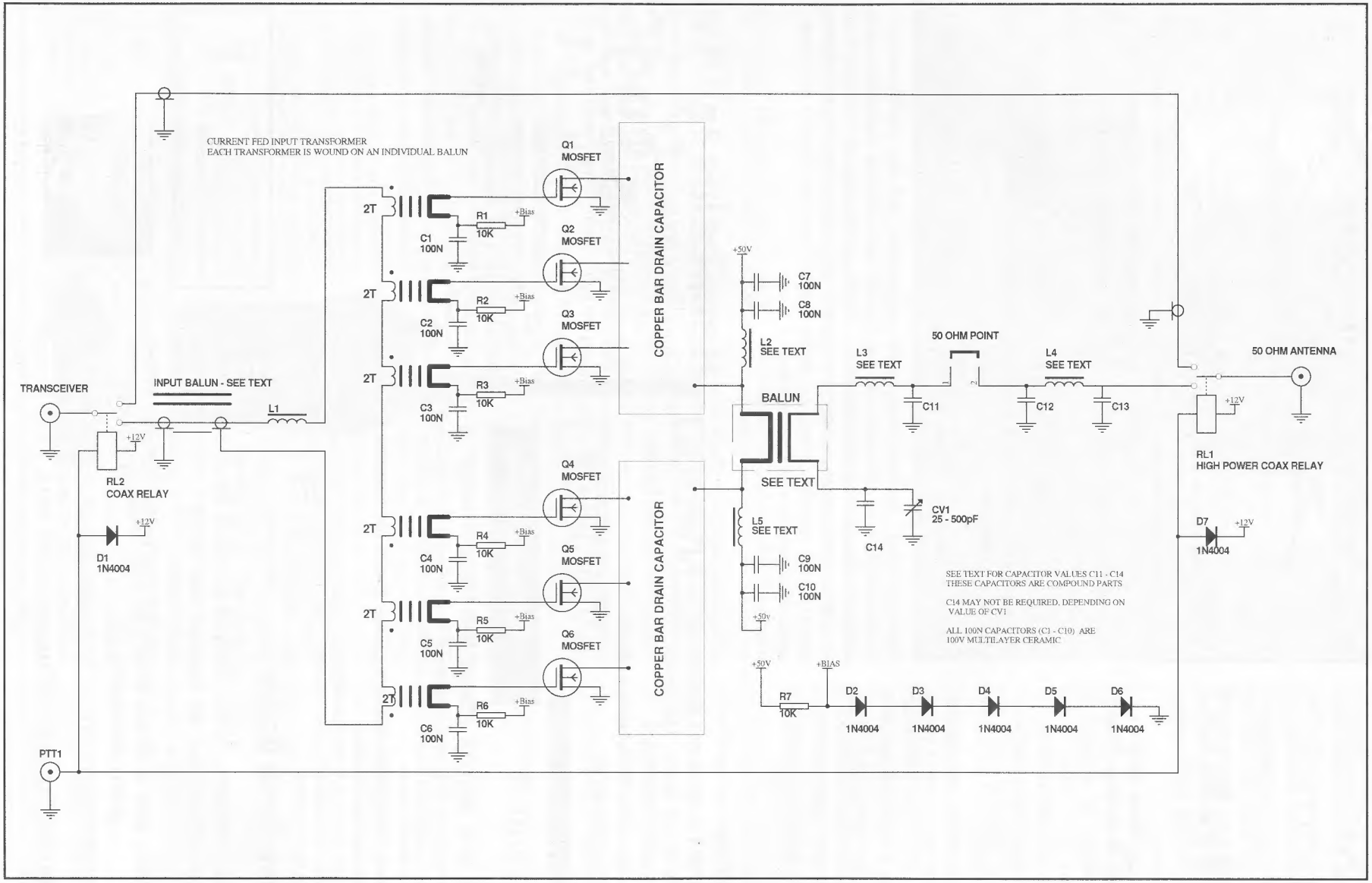


Figure 1: The complete amplifier circuit

my solid state rig to such a monster, so I used my old Collins S-line valve transmitter which, when set to the "key lock" position, produces carrier power that can be adjusted by the microphone gain control. A solid state 100 watt SSB transceiver switched to AM, but with its microphone audio input shorted, will probably deliver 20 - 40 watts average/ RMS carrier power.

At first several characteristics of Class-E seem quite strange. Firstly, output power cannot be adjusted by varying the drive level; rather output power is adjusted by varying the power supply voltage, usually using a variac on the mains input to the power supply or a variable power supply.

Secondly, the amplifier tank circuit is not tuned for maximum power output, but rather for maximum efficiency which will occur slightly off the point of maximum power (and if a Class-D switch mode pulse width modulator is used, for the desired load impedance presented to the modulator's output low pass filter – more on that later).

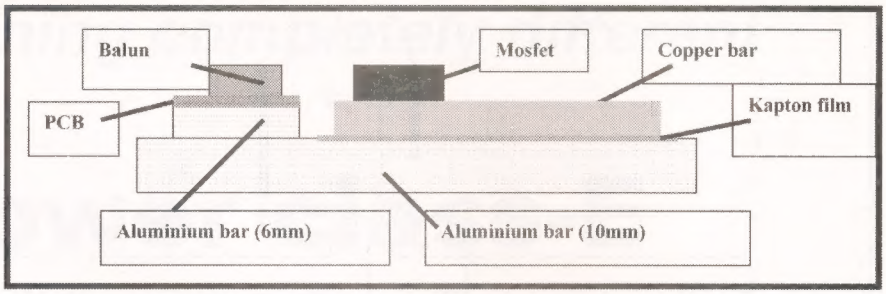


Figure 2. Cross section of input balun and MOSFET sub-assembly

Still feeling brave? Let us look at the amplifiers design and construction in detail, but first some words of caution. This amplifier contains very high RF voltages and RF currents, and this article is really only intended for general interest. If you attempt to build this amplifier you must take care to avoid injury from RF burns, exploding components and/or exposure to dangerous levels of electromagnetic radiation. Do not substitute cheaper or more commonly available components as they will quickly fail, possibly explode, and certainly adversely affect performance. In short, this amplifier is not for the faint-hearted, financially challenged, or the novice constructor.

The input matching and balun network, together with the MOSFETS and their drain capacitors, are constructed as sub-assembly on a 280 mm x 100 mm x 10 mm flat aluminium bar. This ensures a perfectly flat surface (for the drain capacitors) and also allows assembly of the most difficult components on the bench, separate from the chassis. I would strongly recommend this method of construction. See Figure 2 and Photo 2.


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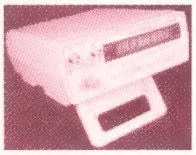

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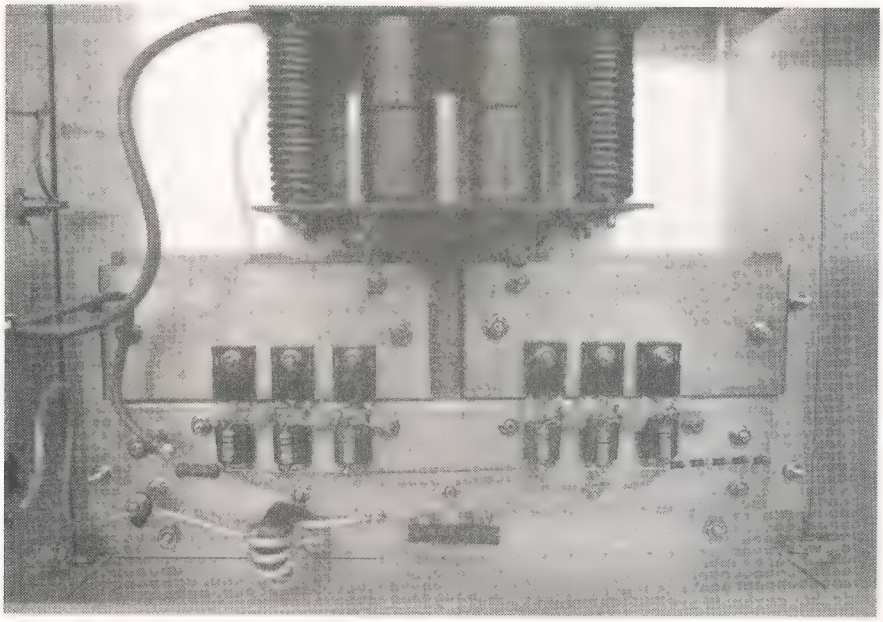

Photo 2. The input balun assembly (lower), MOSFETs mounted on home made drain capacitors (middle), and the output balun (top). The brown material is DuPont Kapton film forming the insulator and dielectric in the capacitors formed between the copper plates and the 10 mm aluminium bar. The coax input balun and input inductor (L1) are lower centre.

## 50 ohm input matching network

The input matching network consists of a toroidal current balun and a series inductor, L1. The balun is made by winding 8-10 turns of RG316 coax around a 25 mm diameter core (ferrite type 43 or F14 or L15).

The series inductor L1 consists of seven turns of 22 gauge wire wound on a short length of approximately 6.5 mm F25 ferrite rod. The number of turns and turn spacing on L1 can be adjusted for lowest input SWR, (even with the power turned off). I used an MFJ-269 analyzer for this task during construction.

## Current fed input transformer network

The series connected balun transformers, which connect to the gates of the MOSFETs, form a current driven input network capable of driving the very high MOSFET gate capacitances, (typically 3450 pF for each MOSFET!). The transformers do not have a common magnetic core, consisting of six individual two-hole balun cores with their primary windings in series and phase reversed between each block of three MOSFETs. Photo 3 shows a close-up of one set of three MOSFETs and their input circuit.

The secondary windings (connected to each MOSFET) consist of short lengths of 3.5 mm diameter brass tube inserted into each balun hole and connected together with wire at one end to form one complete turn. Wind the secondary first, being careful not to let solder run inside the brass tubes.

The primary windings are then wound from a continuous length of 22 g Teflon insulated wire, with two turns passing through the inside of each brass tube. Photo 3 shows how to wind the primaries for the correct phasing. Only use Teflon insulated wire as other insulating materials will melt during soldering at a later stage.

The baluns are mounted on a 240 mm x 40 mm length of copper-side-up fibreglass PC board (you could also use copper sheet) which in turn is mounted on a length of 240 mm x 40 mm x 6 mm aluminium bar, which in turn is mounted on the 10 mm thick base bar. (The intention is to raise the mounting position of the earth plane and of the baluns to match the source and gate leads of the MOSFETs). Use evenly spaced nuts and bolts to hold the assembly together and ensure a low impedance ground connection.


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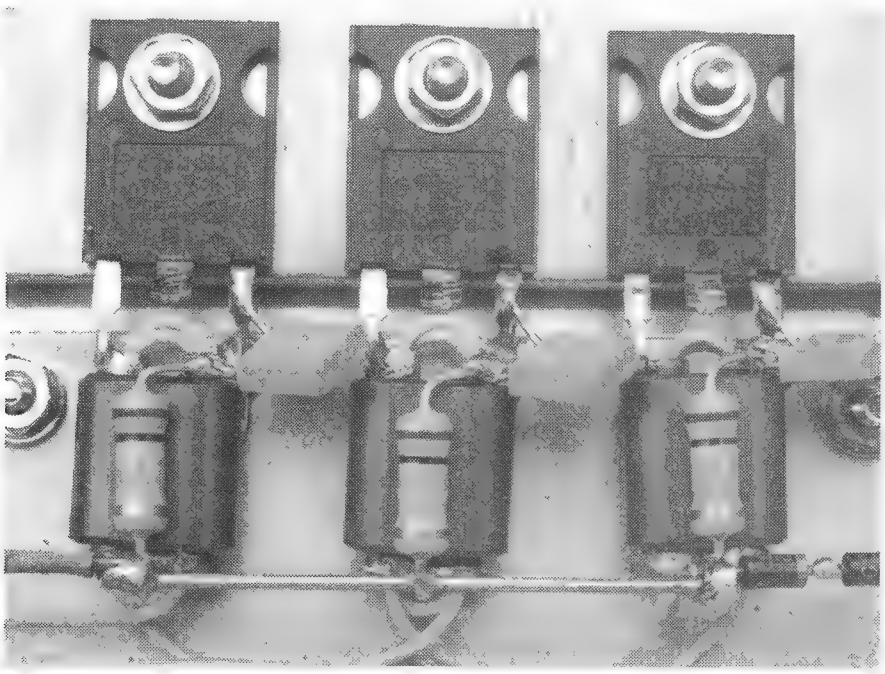

Photo 3. Connecting the input balun transformers to the MOSFETs

The MOSFET source leads are soldered onto the grounded pc board and the gates are soldered onto the corresponding brass tube secondary windings. Bypass capacitors C1 – C6 are connected from the cold end of the secondary winding to the grounded source lead, and bias resistors R1-R6 are positioned over the top of the baluns.

All connections must be as short as possible (only a few mm) as the series inductance of any lead length will be significant compared to the MOSFET's input impedance, and will severely affect performance.

## MOSFET assembly

Refer to Photos 2 and 3. The MOSFET assembly has three purposes; to mount the MOSFETS; to provide good thermal transfer; and to form a high current RF capacitor between the MOSFET drains and ground.

The six MOSFETS are mounted on two 125 mm x 50 mm x 6.5 mm copper plates cut from a length of electrical buss-bar obtained from a local scrappy. File all facing surfaces so they are absolutely flat. The MOSFETS are fastened onto the top surface of each copper plate using M3/20 mm bolts and nuts, with the bolt head deeply countersunk into the underside of the copper.

The MOSFETs must make good electrical connection from their body drain connections to the copper plates – DO NOT use insulating washers or thermal grease under the MOSFETs. Individual MOSFETs can be easily replaced, without disassembly of the entire module, by simply undoing the upper M3 nut.

The copper plate assemblies, with their three MOSFETs in position, are clamped onto the 100 mm aluminium base bar using insulated nuts and bolts. A layer of 0.005" (0.127 mm) DuPont Kapton film is inserted between the copper and aluminium and acts as insulating dielectric and heat transfer material. DuPont Kapton film has excellent electrical and thermal properties and should not be substituted.

The value of the drain capacitors formed is not critical, but ideally should be approximately equal to the total MOSFET drain capacitance. The capacitors measured about 700 pF using the MFJ-269 analyzer.

## Output balun and choke assembly

See Photos 4 and 5, and Figure 3

### Construction of 3-turn output transformer

The output transformer and choke assembly uses large ferrite tube cores mounted over brass tubes with the whole assembly held between fibreglass PCB end plates. Ferrite cores are mounted two-in-line beside two-in-line.

On 40 metres the ferrite material chosen for the balun transformer (inner four cores) is Fair-Rite type 61 or equivalent, the primary and secondary windings are three turns each with the brass tubes forming the centre turn on the primary. Only use silicon or Teflon insulated wire to prevent insulation breakdown, (such as heavy gauge silicon insulated multimeter test lead wire).

The power feed chokes are wound on slightly thinner diameter ferrite tube

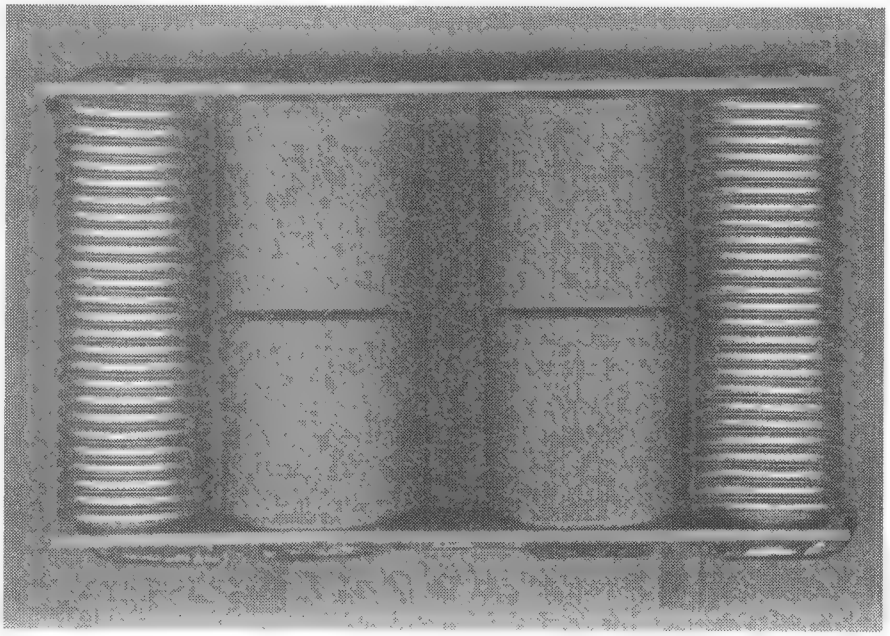

Photo 4. Top view of the output balun assembly prior to adding the windings

cores, two ferrite tubes for each choke, which are also mounted on brass tubes held between the PCB endplates. Wind #12 enamelled wire over a slightly thinner mandrel and then slip over the ferrites during assembly. Tricky, but effective.

The 100 nF bypass capacitors C7 – C10 are mounted on the PC board endplate. These capacitors must be high current, low impedance types and must also have very short leads. The whole assembly is mounted in position on the chassis with 12 mm aluminium angle. The mounting assembly also provides the earth connection for the bypass capacitors.

## Output tuning and filter inductors

See Photo 6

Refer to photo 6. L3 (the lower inductor) resonates with C11 and CV1/C14. Due to the high RF voltage, CV1 must be a wide spaced transmitting type variable capacitor rated to at least 2 kV. The padder capacitor C14 may not be required depending on the value of CV1. L4, together with C17 and C18 form a Chebycheff (0.2 dB ripple) low pass filter at Fo = 8 MHz.

The inductors can either be wound as shown in the table, or could be heavy duty commercial coil stock. If possible confirm their actual value using an inductance bridge operating at 7 MHz.

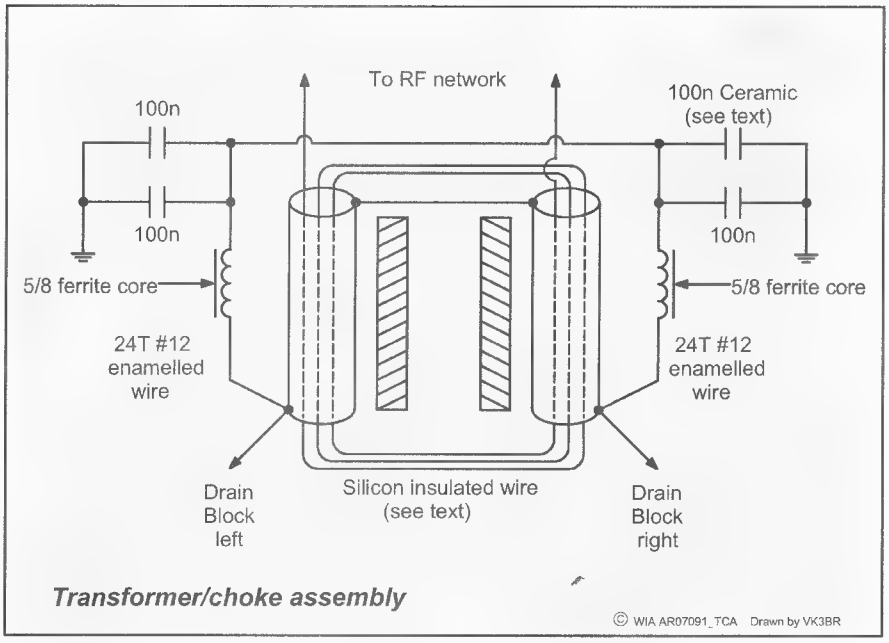


Figure 3

| Inductor | Core Material | Diameter | Turns/ Inductance | Wire Size/length |
|---|---|---|---|---|
| L3 | Air wound | 40 mm | 1.3 uH | #12, 6.5 turns 50 mm long |
| L4 | Air wound | 30 mm | 1.1 uH | #14, 6.0 turns 35 mm long |

## Capacitor selection

Correct capacitor selection is extremely important when dealing with high RF currents or voltages. Common high voltage ceramic capacitors are not suitable for use in this circuit and may explode very spectacularly. High voltage "doorknob" capacitors have significant loss and should also be avoided. (The author has experienced exploding capacitors, as well as fires inside the balun transformer from insulation breakdown when using PVC insulated wire – but the MOSFETs survived!)

Vitramon VY81, VY82, VY83, VY84 series capacitors (2000 V) or ATC 100 E Series Porcelain High RF Power Multilayer Capacitors (7200 V), available from sources such as Surplus Sales of Nebraska, USA, appear to work well. Smaller value capacitors in parallel are used to share the total RF current. If you intend running very high power you should probably use more capacitors in parallel to share the current load.

| PART | VALUE | TOTAL C |
|---|---|---|
| C11 | 3 x 470 pF<br>2 x 200 pF | 1810 pF |
| C16 | Padder | (as required to tune CV1) |
| C17 | 1 x 470 pF | 470 pF |
| C18 | 1 x 470 pF | 470 pF |

Bypass capacitors must efficiently bypass very high RF currents. All 100 nF bypass capacitors must be AVX-CK06BX104K multilayer ceramic or equivalent type and must be soldered with very short leads. Do not use

### Output balun transformer details

Only use silicon or Teflon insulated wire to prevent insulation breakdown. Use type 61 ferrite material for 40 metres.

| Design | Core Type | Core Size | Winding |
|---|---|---|---|
| 4 cores mounted between pcb endplates 2 in-line beside other two. | 4 off Fair-Rite Products 2661 102002<br>or<br>4 off Neosid 28-112-28 | Each core 25.9 x 28.6 with 12.8 mm hole | Primary: 3 turns total comprising 1 turn made from 12mm (1/2") brass tube between G10 PCB end plates plus 2 turns of thick silicon insulated wire. Secondary: 3 turns of thick silicon insulated wire. |

### Power Feed Choke Details

Use type 43 ferrite material for all frequencies.

| Design | Core Type | Core Size | Winding |
|---|---|---|---|
| L2 & L5 Mounted on drain transformer assembly. See drawing | 4 off Surplus Sales 28B0625-100<br>or<br>4 off Fair-Rite 264362 5102<br>or<br>4 off Neosid 28-074-38 | Each core 16.2 x 28.6 long with 7.9 mm hole | 24 turns #12 enamelled wire |

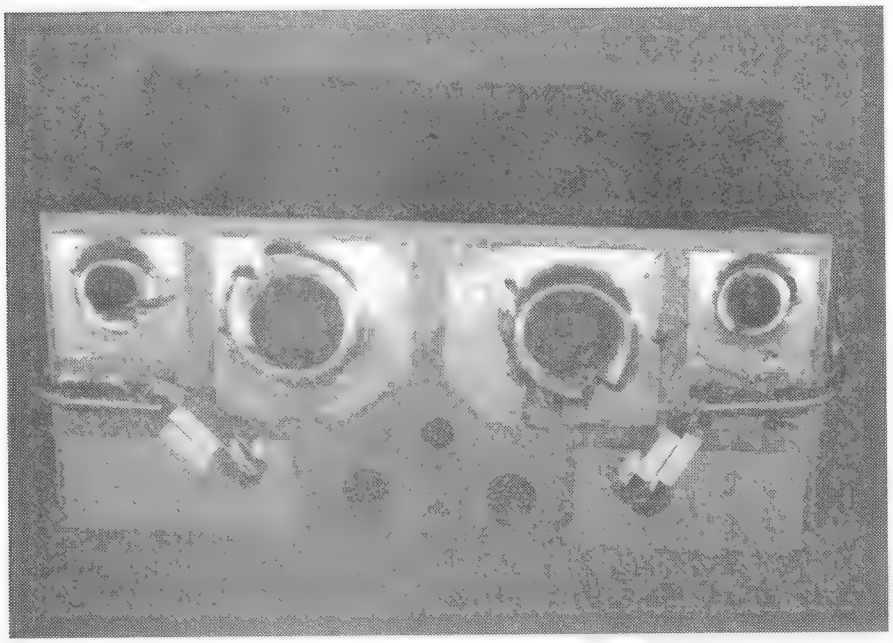

Photo 5. End view of the output balun assembly prior to adding the windings

common disc ceramic, mono ceramic, nor foil capacitors.

## Power Supply

The power supply will depend on your power requirements. The more powerful the power supply the more power output you will achieve. The maximum voltage is probably around 80 volts, but is untested. As my transmitter was intended for amplitude modulation at 400 watts peak power, and using a series modulator which sets the quiescent supply voltage at 40% of peak modulation voltage, I used a 50 volt power supply.

If you intend running AM or a pulse type modulation, you should use large filter capacitors (say 10,000 uF) designed for high current applications to ensure adequate peak current capacity.

Naturally, any high current power supply should be protected against current overload and excessive output voltage at small loads. Additionally it must be designed to limit surge currents at switch-on through the rectifier into the discharged storage capacitors.

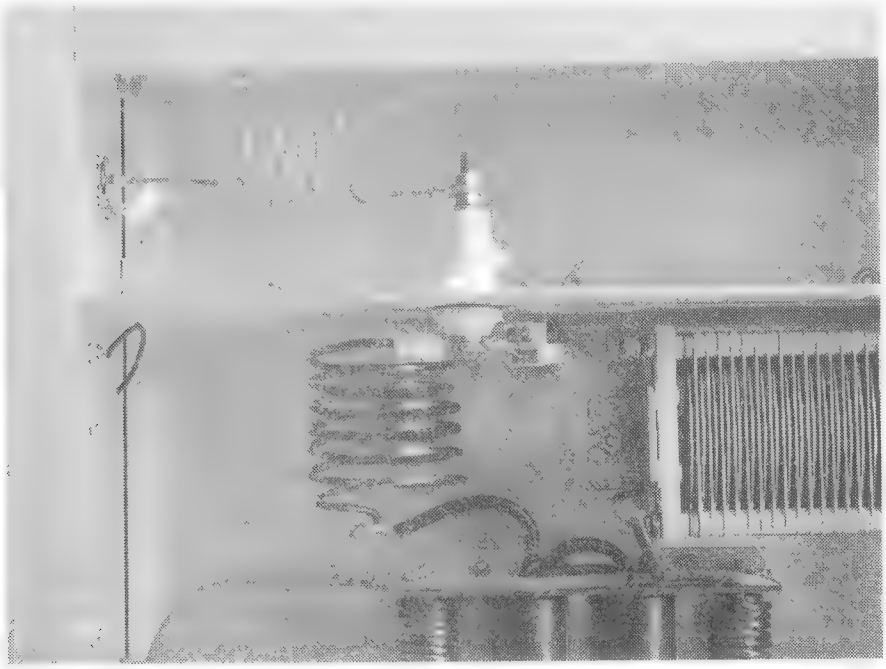

Photo 6: Output tuning and filter inductors

## RX/TX Switching

The circuit shown uses two antenna changeover relays to allow a transceiver to be used as the exciter. If a separate receiver and exciter are used, only one antenna changeover relay will be required.

When switching from transmit to receive, driving power must be removed before releasing the amplifier's power and antenna changeover relays. Otherwise your expensive relay contacts will quickly disappear. The Collins S-Line conveniently has an "antenna relay output" which can be used to control the PTT line in the amplifier. Using this control output, the exciter's power will always be off before the amplifier switches to standby.

When switching from receive to transmit, the exciter power should be applied only after the relays in the amplifier have had time to operate.

## Stand Back and Turn On

For initial tests connect a Variac to the 240 V mains input. Set the DC supply voltage to about 10-15 volts and connect a power meter and a large 50 ohm dummy load.

Set the output tuning capacitor to fully meshed (maximum capacitance). Apply drive and slowly un-mesh the output capacitor noting the power output and the DC current. You should notice that the current rises quickly near resonance to a point where, although current continues to increase, power output does not rise in proportion. Back off the tuning capacitor to a point which appears to give best efficiency (or trade-off between DC current and power output).

Try this a few times to get a feel for what is going on, and when happy all is OK increase the Variac output slowly. You should see the power output increase. When you have achieved your desired power output, and nothing has blown up, retune the output for best efficiency (you may need a calculator for this), and again adjust the Variac.

For each power output level you will find a "sweet point" (between supply voltage and current) which provides highest efficiency. If you detune the tank circuit too far you may cause excessive heating in the output transformer core.

In all cases it is best to adjust the supply voltage and go for maximum efficiency for each carrier power output level.

## Other Bands

With suitable changes to the output tuned circuit and low pass filter values, this circuit will operate on 160 and 80 metres. To reduce loss in the output transformer type 61 ferrite material was used on 40 metres, with three turns for the primary and secondary windings. On lower bands use type 43 ferrite material with single turn primary and secondary windings, (the single turn primary is simply the brass tubes connected at one end).

The table gives suggested starting-point values for operation on 160 and 80 metres, based on a 10 ohm to 50 ohm impedance transformation. Naturally, the output filter will also need to be changed.

| Band | CV1 // C14 | L3 | C11 |
|---|---|---|---|
| 160 | 2100 pF | 5.6 uH | 3500 pF |
| 80 | 980 pF | 2.7 uH | 1700 pF |

Due to the high voltages and high currents, multiband switching is not really practical.

## The Chassis

The chassis is made from standard aluminium extrusion and cut sheet. Use 100 mm U-Channel for the sides and back panel, with short lengths of 12 mm angle fixing the inside corners. The returns of the side U-Channels face inside, and the rear U-channel returns face outside. The front panel is made from a 390 mm length of 4 mm x 100 mm extruded bar. The bottom panel is 3 mm aluminium sheet sitting on, and fixed to, the lower U-Channel returns. The top cover is 1.5 mm aluminium sheet. Overall dimension is 380 mm wide by 300 deep with a 5 mm overhang on the ends of the front panel (could be made longer if rack mounting is required).

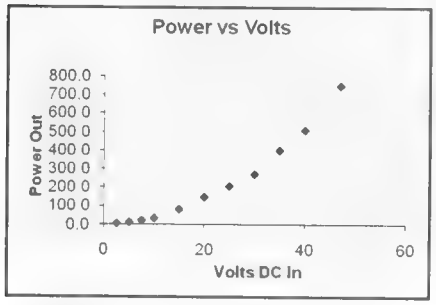


Figure 4: Output power in relation to supply voltage

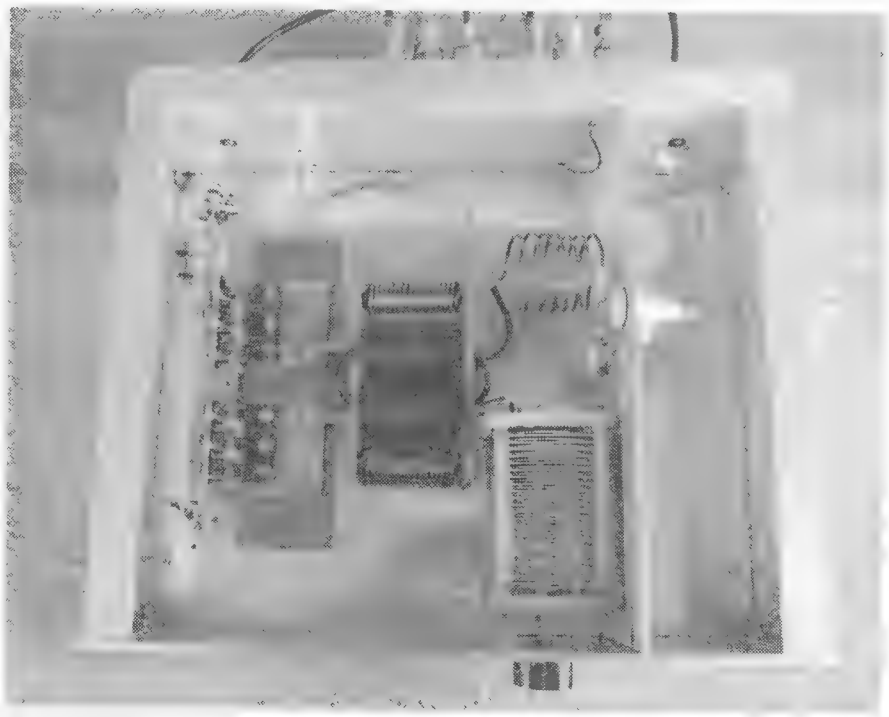

Photo 7. Internal view of the amplifier. The coax switching relays are mounted externally on the rear panel. An aluminium divider forms a compartment for the output filter (right).

## Performance

Power output into a 50 ohm load versus supply voltage is shown in the graph. The amplifier tuning was not changed during the test. The efficiency achieved at 200 watts output is in the order of 80-85%. Expect higher efficiencies on lower bands.

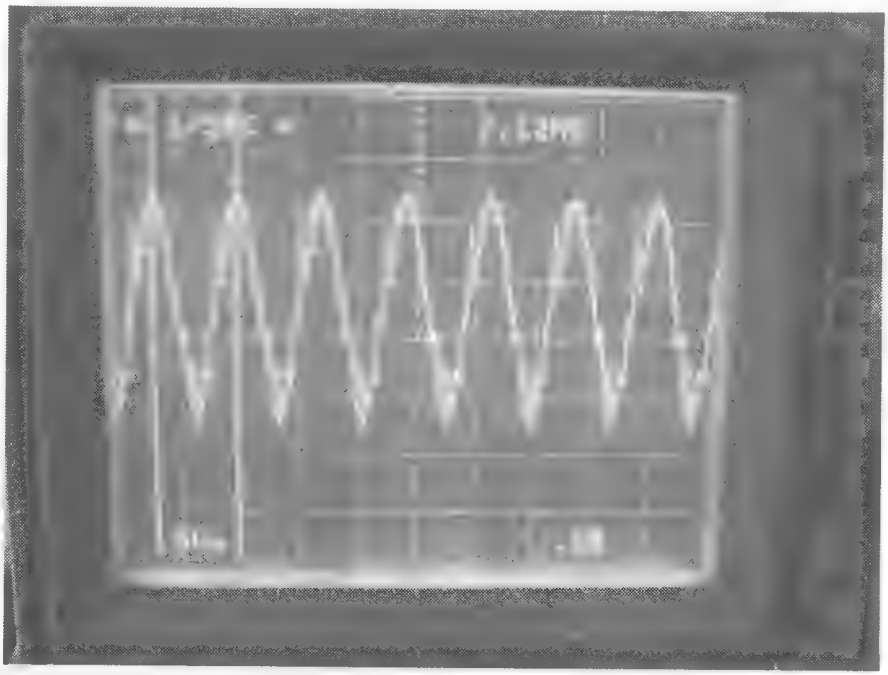

Photo 8. HP8591E spectrum analyser sweep from 2 MHz to 50 MHz. The second harmonic is 60 dB below the fundamental, and the 3rd harmonic 70 dB below. An MFJ high power dummy load was modified to provide a sample output for this test, (L-network off input connector consisting of 4k7 non-inductive resistor and 50 ohm resistor to ground).

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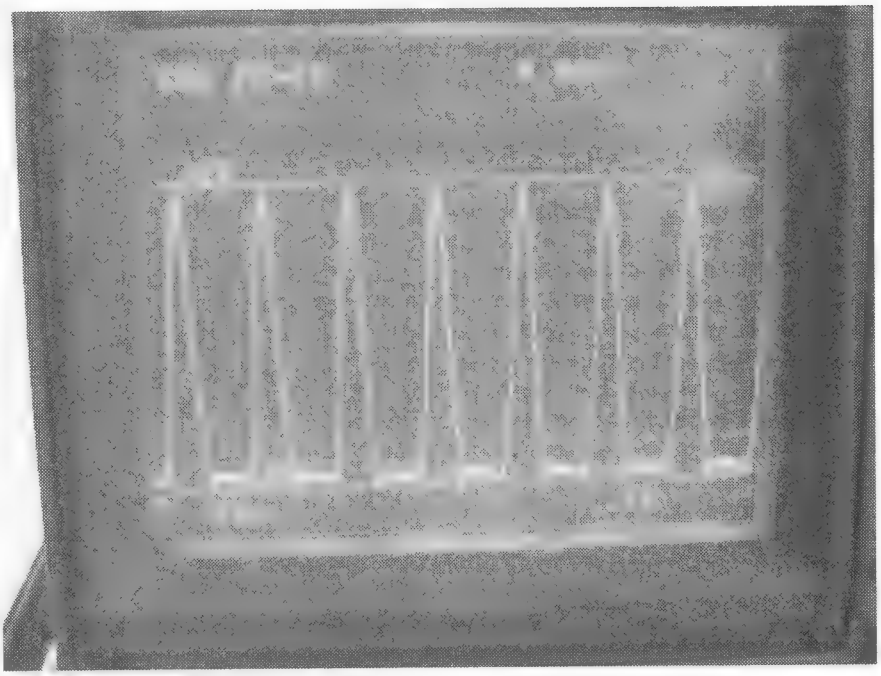

Photo 9. Gate voltage waveform (using x10 probe) at 30 watts driving power. Peak gate voltage is around 20 V p-p. The positive swing is about 12 volts zero - peak.

The drain capacitor value is correct if the peak RF voltage across the MOSFETs during the "off" cycle is around 3.5 times the DC voltage applied to the stage. Increasing the drain capacitors decreases the voltage excursion, and vice versa.

In a subsequent article, I will describe a highly efficient "broadcast quality" Class-D (variable pulse width) AM modulator which will push this amplifier to its full output, and give you the best sounding signal on air.

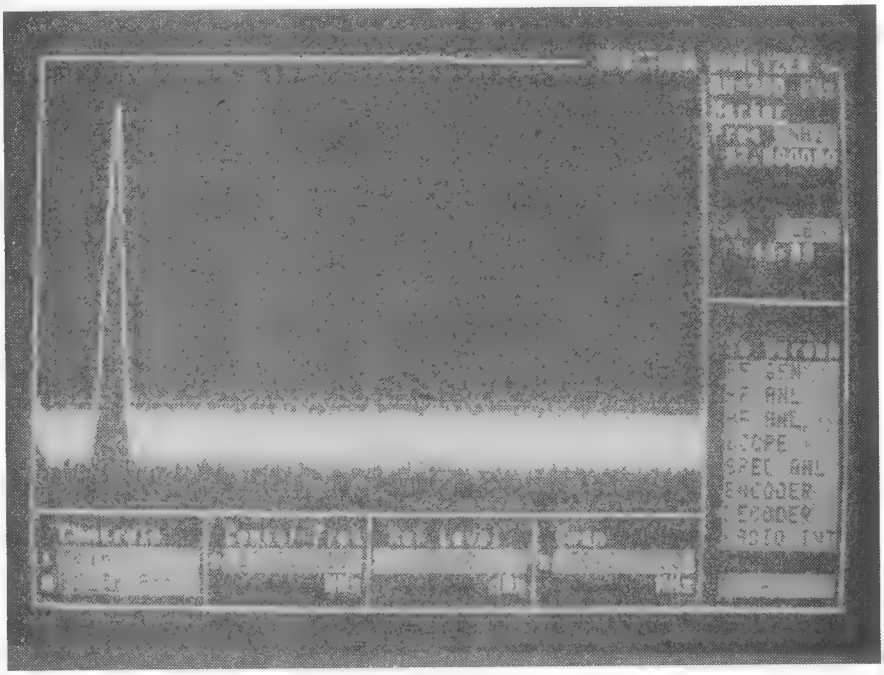

Photo 10. Drain voltage is around 100 volts p-p using a 27 V DC supply (using x10 probe). Top and lower limit lines are internally generated by the oscilloscope.

# Repairing an Icom PS-30 power supply

Warren Stirling VK3XSW

**I recently saw an advertisement on VKham for an Icom PS-30 switchmode power supply. After some searching the internet with Google to find out more about the PS-30 and to check for known problems and any reviews of the same (from the Eham site), I bought it.**

## Reading the manual and sorting the specs

The PS-30 power supply is circa 1980 and was intended to be used as the main power supply for an amateur radio station. It is rated at 13.8 V dc, 25 amps, and 10 minutes on/10 minutes off, 50% duty cycle. The dc output voltage tolerance is 10%, which may seem a bit high (I have a commercial 13.8 V dc supply that only drops 500 mV when 22 A is drawn from it), but is in keeping with the age of the design (I have checked the specifications for the dc input tolerance of some of the HF rigs from that era and they show a 15% tolerance of 13.8 V dc).

To this end the PS-30 has three two pin connectors across the back panel (each rated at 6 A) and the usual single 6 pin dc power connector common to HF radios of the era, fitted at the end of a short lead. Removal of the Icom nameplate on the rear panel will uncover two holes where banana sockets can be fitted if required.

The front panel has a power switch, power on indicator LED and an illuminated analogue meter, which indicates either the dc output voltage or the dc output current, this being selected by a rotary switch, also on the front panel. In the example I purchased, initial testing showed that the power on LED, the meter scale lamp and the current indication function of the front panel meter were not working. Otherwise the power supply worked.

In the course of surfing the 'net for information on the PS-30 I had downloaded the user manual and schematic, together with adjustment information for the power supply and regulator boards (authored by Adam Farson VA7OJ/AB4OJ). I also found an article on the repair of the power supply (authored by Ernesto Lastra Bohme DF1ELB) and downloaded it as well. I made sure that I was familiar with this information before I tackled the power supply faults.

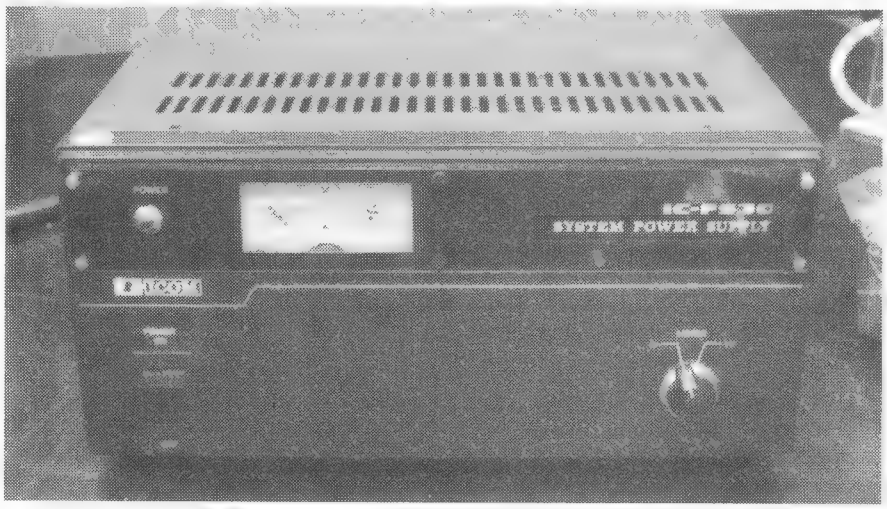

Photo 1: The front panel of the Icom PS-30 power supply.

## Screwdriver time

Removing the six screws that held the power supply top cover revealed uninsulated mains wiring, which was common practice when the power supply was made (I have seen both Icom and Kenwood equipment wired this way), a cooling fan driven by an induction motor and a circuit board, mounted on standoffs to a black diecast box which was in turn attached to the bottom of the case.

This board is the supply board which has several functions: it converts the incoming ac mains to high voltage dc for the switchmode regulator, contains the circuitry that drives the current function of the front panel meter and also a small linear supply used for both the current indicator circuitry and as a bootstrap power supply to start the main switchmode regulator.

Visual inspection of the supply board showed that the magic smoke had definitely escaped from resistor R12. Consulting the schematic, I found that this resistor together with zener diode D6 and capacitor C17 form a shunt regulator, powered from the 13.8 V dc output, which feeds the power on LED and the meter scale illumination lamp. Further testing showed that the power on LED was OK but that the meter scale illumination lamp was open circuit.

The schematic of the power supply does not indicate the clamp voltage of zener diode D6. While I could get a replacement diode from Icom I felt that I could sort it out myself. After isolating the power supply from the mains and allowing the main filter capacitor bank to discharge, I removed the six screws holding the supply board to the black diecast box and removed the zener diode, which was shorted, and the remains of resistor R12.

## Repair, replace, refurbish

I replaced the meter lamp with a 5 mm green LED, as I had some to hand and I have found that LEDs do very well as replacements for the meter lamps used in amateur equipment, and fitted

it into the existing lamp grommet. After experimenting with powering the LED from a variable voltage test supply to find the voltage for best meter scale visibility in low light, I temporarily paralled the power on LED with the new meter scale LED and found its brightness acceptable, so the green LED was connected via the original lamp wiring in parallel with the power on LED wiring,

The connection was made at the rear of the Vo/Io meter function switch which includes a 1k ohm ¼ W resistor, mounted on the rear of the meter switch and wired in series with R12 on the supply board, which was replaced with a 22 ohm ¼ W resistor.

Zener diode D6 on the supply board was not replaced as I think the shunt regulator was there mainly for the dial lamp and is now not needed as the new meter scale lamp is a LED (and also because I did not know what zener voltage to use when replacing it).

I did note that the coil of relay RL1 on the supply board, which is powered from the 13.8 V dc output (and functions as a soft start circuit for the power supply) does not have a diode across it to clamp any spikes the relay coil will generate when the power supply is turned off. I soldered a 1N4007 diode directly across the relay coil, on the underside of the board, to fix this as the spike generated by the coils magnetic field collapsing would appear on the 13.8 V dc output. While I had access to the solder side of the supply board I resoldered all the joints as some of them looked decidedly unreliable.

With the meter scale illumination and power on indicator working, it was time to sort out the current indicator. The current sensor is on the regulator board and to access this board requires removing the diecast box (in which the regulator board is mounted) from the power supply bottom cover. Note that the screws securing the diecast box to the bottom cover are insulated from the power supply metalwork, as is the diecast box.

At this point in the proceedings I reinstalled the supply board on its standoffs and, to make working on the regulator board that much easier, decided to replace the power supply top cover which would hold the front and rear panels in the correct alignment as the power supply would have to be operated while it was upside down in order to test and adjust the regulator board.

After removing the six insulated screws holding the diecast box to the bottom cover, I removed the power supply bottom cover, which involves removing eight screws with lockwashers and the two screws that hold the dc output terminal strip to the bottom cover. I did not remove the mains terminal strip, which is also screwed to the bottom cover, as I found that with the power supply turned upside down the mains wiring has enough slack to allow the bottom cover to be 'hinged' out of the way and not have any of the mains wiring touch the metalwork. It did, however, present a possible shock hazard, so I was careful to exercise due caution.

Now that I had sorted out the basic access to the diecast box, I had a look at it and found that the bottom of the diecast box could be removed by unscrewing


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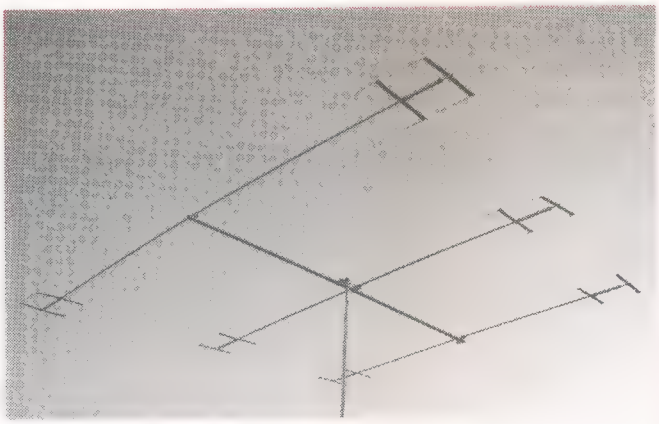

| SPECIFICATIONS | |
|---|---|
| FREQUENCY | 14, 21, 28 MHz BAND |
| MAX.ELEMENT LENGTH | 5520 mm |
| BOOM LENGTH | 4.0 m |
| GAIN | 6 / 6 / 7 dBi |
| FRONT TO BACK RATIO | 20/ 15/ 14 dB |
| FEED IMPEDANCE | 50 ohm |
| TURNING RADIUS | 3.74 m |
| WEIGHT | 12 kg |
| POWER RATING | 2 kW PEP |

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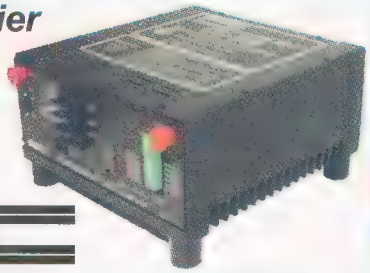

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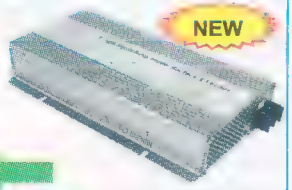

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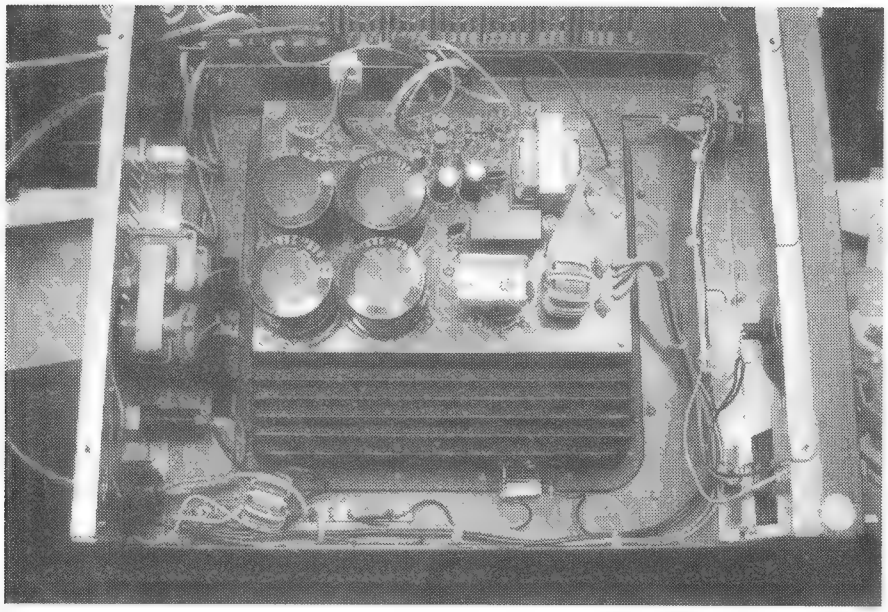

Photo 2: An overhead shot of the internals of the PS-30 power supply.

a mere eighteen self tapping screws. These are under a clear plastic cover that ensures the diecast box metalwork can not touch the power supply bottom cover. This plastic cover is glued to the bottom of the diecast box but it can be flexed enough to easily access the screws that hold the lid on.

## All is revealed

With the lid unscrewed, I had a look at the regulator board.

To remove it involves unsoldering three high current connections to a smaller board mounted in one corner of the diecast box, removing four plastic screws holding down the four transistors soldered to the regulator board and unscrewing the seven screws that hold down the regulator board itself. The regulator board can then be carefully 'hinged' away from the diecast box as there is just enough play in the wiring that exits via each of two grommets in the side of the box to allow this.

Referencing DF1ELB's internet article that mentioned a specific fault, I checked the area of the regulator board mentioned in the article and found two resistors, virtually covered with a brown 'glue' used to hold down the capacitors on the regulator board. Multimeter testing (with the power supply unplugged from the mains) showed that one resistor read low and the other was open circuit.

These two resistors are wired across the two 33 uF capacitors that are wired in series across the high voltage dc fed from the supply board. There are another two resistors of the same value (68 kohm, ½ W, 5%) on the supply board, wired across the main capacitor bank. For the sake of easy confusion, both sets of resistors are designated in the schematic as R1 and R2.

Calculations with a plastic brain (calculator) showed that these resistors would dissipate around 400 mW which I felt was a bit close to their 500mW limit; and as two of them were faulty anyway, all four were replaced with 1 W metal film resistors of the same ohmic value. While I had the soldering iron to hand, I resoldered all the joints on the regulator board as some of them looked decidedly unreliable.

I then replaced the regulator board, checked I had properly reconnected everything I should and made sure that the cooling fan could spin without fouling anything. The dc output terminal block was insulated so that it could not touch the potential short circuit represented by the side of the case. I found that the assembly of the supply board and regulator board (in its diecast box) would rest easily on the four large capacitors on the supply board which would also keep the whole assembly isolated from the case metalwork.

### The acid test— switch on (but stand well back)

With some trepidation and making sure I was well outside the blast radius, I turned the power supply on. It all worked as expected so I connected a current sink set for 4 A (which I had lying around, as you do).

Success! The current indicator function of the meter was now working, although it was off calibration.

Checking voltages around the regulator board with no dc load current and then again with approximately 22 A load current (doesn't everybody have eight paralleled 5 ohm 95 W ceramic resistors to hand?) I noted that the dc voltage across each of the two 33 uF capacitors (C4 and C5) dropped by about 10V at approximately 22 A load current with reference to the no dc load current state. These two capacitors are specifically mentioned in the article by DF1ELB as requiring replacement.

## More replacement

This same internet article also mentioned replacing C18 to C21 (470 uF 16 V) and C22 (4700 uF 16 V) on the regulator board, together with C14 and C16 (470 uF 16 V) on the supply board, with 35 V rated equivalents.

I checked these capacitors and found they all had a temperature rating of 85 degrees centigrade which, for the regulator board capacitors, I felt was a bit low as the diecast box in which the regulator board is mounted has no internal air cooling (or indeed air flow at all, which is one of the characteristics of the space inside closed boxes), so I sourced replacements with a temperature rating of 105 degrees centigrade (except for C22, the 4700 uF 16 V dc output filter capacitor as I could not find a 35 V dc rated replacement that would physically fit).

After all the replacement capacitors were sourced, I removed the regulator board (again!) and replaced the capacitors one at a time to make it harder for me to put the right capacitor in the wrong place. Following the removal of each capacitor, the brown 'glue' on the board around where each capacitor had been was carefully removed with a sharp knife. Once all the capacitors were replaced they were glued down with Dow Corning 738 electrical sealant, which I had on hand.

The other important property this has, apart from being non-conductive is that it is NEUTRAL CURE. This means that as it cures it does not produce any acidic

or acetic compounds. This is important, given that the (mildly) corrosive properties of the previous brown 'glue' caused some of the problems I had fixed.

With the regulator board reinstalled in the diecast box the power supply was tested after the sealant had cured and on checking the voltage drop across each of the two 33 uF capacitors on the regulator board I found the voltage drop was now 5 V with 22 A load current drawn, with reference to the no dc load current state, where it had been a 10 V drop with the original 33 uF capacitors.

The power supply was then set at 13.8 V dc no load with preset pot R5 and then the 22 A load was again applied. Previous testing showed an approximate 1 V drop from 13.8 V when a 22 A load was applied which is well within the 10% tolerance specified. The current limit was then set, with preset pot R10, in the following manner: with the 22 A load connected preset pot R10 is adjusted so that the output voltage starts to drop with a 22 A load applied and then is readjusted slowly until the output voltage just stops rising (if the output voltage continues to fall as you adjust the current limit preset then turn the preset the other way). With the 22 A load removed the dc output voltage should again be 13.8 V dc. In the instance of the PS-30 I was working on, at 22 A load the dc output was approximately 12.8 V. Both of the presets are on the regulator board.

DF1ELB's article also recommended changing C4 and C5 on the regulator board from 33 uF to 47 uF, the intent being to improve the regulation of the dc output. I have tried this, with very little improvement. Ernestos' article does not, however, make mention of the mains supply voltage he was using when he wrote the article, which would make a difference as the high voltage dc circuit on the supply board works as a voltage doubler when the mains input is set for 110 V ac and as a rectifier when the mains input is set for 230 V ac.

## Power off —recalibrate — covers on

I then turned the power supply off and replaced the insulated lid on the diecast box and replaced the eighteen screws that hold the lid on and reinstalled the diecast box on the bottom cover of the power supply with the six insulated screws. Just for fun I checked that the diecast box was indeed open circuit to the power supply chassis, as it should be, before doing anything else.

Since I had the power supply top cover off anyway when reinstalling the diecast box, I recalibrated the meter dc output current scale. This is done by switching the meter switch to Io (output current) and then adjusting the current meter scale to zero with preset R15 while there is no dc current drawn from the power supply. A 10 A load is then connected, so that the meter needle will be approximately mid scale when correctly calibrated, mid scale being the most accurate part of the scale for a moving coil meter, and then preset R14 is used to adjust the current meter calibration with the 10 A load connected. Both R14 and R15 are on the supply board.

## Voltmeter

The voltmeter is calibrated by switching the meter switch to Vo (output voltage) and then adjusting preset R4, which is on the back of the meter switch, to show the correct output voltage while there is no dc load connected.

One of the interesting things I found while testing the power supply was the presence of a 390 V, approximately, peak sawtooth waveform superimposed on both the high voltage dc supply and the 13.8 V dc output. The fun part is that this waveform disappears if the negative side of the 13.8 V dc output is grounded, that is, tied to mains ground. I only found this as I was checking for switching noise on the 13.8 V dc output with the power supply under load; in one of the tests I was using an oscilloscope with the probe floating and in the next test I connected the oscilloscope's probe ground to the 13.8 V dc negative line (and as the probe's ground is tied to mains ground this tied the power supply dc negative to mains ground).

As an aside, trying to use the junction of the 33 uF capacitors on the regulator board as a ground reference for the oscilloscope while looking at switching waveforms on the high voltage dc supply does not work, as this point in the circuit is sitting at approximately 160 V dc and the workbench RCD (which we all have wired in, don't we!) will trip out as it detects you trying to do something stupid like trying to raise the mains ground by 160 V dc. This also results in a smack across the back of the head, courtesy of a person who will remain nameless, from the office next door to the workbench, who has also noticed that the RCD has tripped.

## Back to the manual and a ground-making thought

With all this in mind I had a closer look at the schematic for the PS-30 and found an anomaly, the symbol used to represent the mains earth to the chassis connection and the symbol used for the power supply dc negative are the same (that is, power supply negative is tied to mains ground), yet a resistance check with a multimeter shows that this is not the case. Measuring ac volts between the

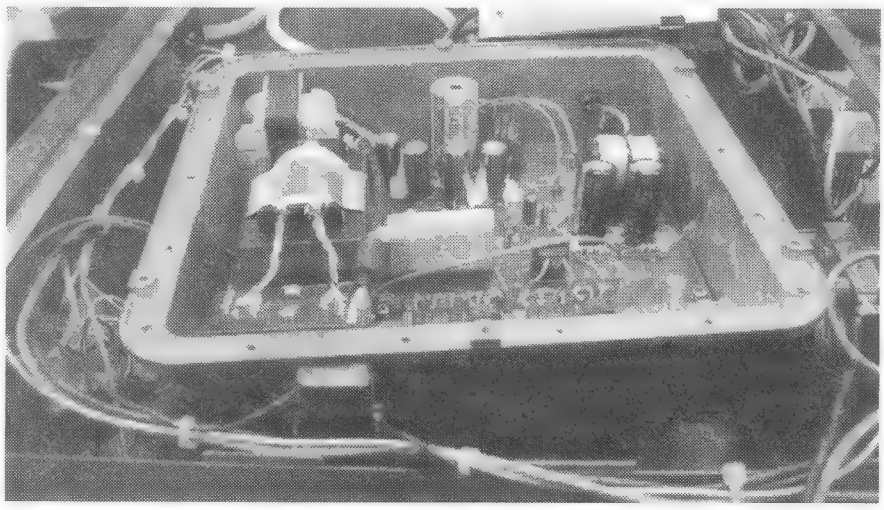

Photo 3: The regulator board of the PS-30 power supply.

power supply dc negative and the PS-30 chassis shows a substantial voltage is present, yet trying to measure the ac amperage and then the ac milli-amperage between the power supply chassis and the dc negative showed zero current flow in both cases.

After some further thought I have come up with a theory, based on how the PS-30 was intended to be used, namely to run an IC-271/471/720/730/740/745/751 transceiver (these models are specifically mentioned in the PS-30 user manual) together with a smaller vhf/uhf transceiver or transceivers.

This theory is based on the following observations: All of the transceivers mentioned and all the other 100 W rated HF transceivers I have seen have a large threaded stud with a wing-nut mounted solidly to the transceiver chassis. This is also tied to the transceiver dc supply negative. This point is intended to tie the transceiver (and yes I know the IC-271 and IC-471 are not HF transceivers) to a common ground point in the shack.

The PS-30 also has one of these threaded studs with a wing nut, located on the rear panel. It is meant to be grounded as well via this stud but since the stud is mounted on the PS-30 metal chassis it is also tied to mains ground. Both the threaded stud on the transceiver of choice and the threaded stud on the PS-30 would be tied together as both would be going to a ground point in the shack, nominally the RF ground. Tying all of our RF generation equipment to the same single ground point is something we all do, don't we?

When the transceiver of choice is plugged into the PS-30, the PS-30 dc negative would be tied to mains ground via the path: transceiver dc negative connection to transceiver chassis – transceiver chassis to ground point via its threaded stud – ground point to mains ground via the threaded stud on the PS-30.

With all this in mind and allowing for some paranoia on my part I tied the PS-30 13.8 V dc negative to mains ground (PS-30 chassis) via a one ohm ¼ W metal film resistor. The intention being that, if there is a large current flow from the power supply dc negative to mains ground, (which there should not be because previously I could not measure any current flow between these points), the resistor will get hot and go open circuit, the smoke and the smell from doing this being an indication of a fault condition.

## Power up — again

Switching the power supply on, again making sure I was outside the blast radius, had no effect on the resistor.

There was no dc or ac voltage measurable across it. Checking the dc output with a floating oscilloscope probe showed no ac at all on either the high voltage dc or the 13.8 V dc output, which is what I wanted. Further testing showed the PS-30 working as expected.

Where did this ac waveform come from? Well each of the diodes in the bridge rectifier on the supply board has a 2.2 nF capacitor across it (C3 to C6) to keep rf out of the diodes. This is very nice but if you draw this circuit out you find that from each side of the ac mains there is a capacitive path to the dc output.

I hear you say, the ac voltage would not get that high because of the forward voltage drop of the diodes in the bridge rectifier! True enough, but only for the two conducting diodes of the four diodes in the bridge rectifier and only for one half cycle. You see, in a four diode bridge rectifier, as used in the PS-30 and numerous other power supplies, only two of the four diodes conduct at one time, leaving a nice high ac voltage across the two non-conducting diodes.

## Grounding and dc negative

So how does grounding the supply dc negative get rid of the superimposed ac?

On the rectifier board each side of the floating high voltage dc has a capacitor directly connecting it to the dc output negative (C2 and C3) and on the regulator board the high voltage dc is indirectly connected to the dc output negative (via C4 and C5 through C6).

So if I tie the dc supply negative to mains ground, or in my case to mains ground via a 1 ohm resistor because I am paranoid, any RF that might appear on the dc side of the supply is provided with a low impedance path to ground, instead of a path to dc negative and possibly ground if both the power supply chassis and the chassis of the transceiver connected to the power supply have been tied to the same ground point.

This leads me to another point, the encapsulated bridge rectifier used (a GBPC 806) has a peak inverse voltage rating of 600 V (that is, the maximum voltage that can appear across a non-conducting diode in the bridge is 600 V) and for a nominal 240 V ac mains input.

I feel this is a bit low given the high voltage dc is a nominal 320 V and any mains borne spikes could easily reach 600 V for long enough to damage the bridge rectifier (yes I know there are some capacitor/inductor filters between the mains input and the bridge but they may not stop a fast, narrow spike that could damage the bridge rectifier) so I replaced the bridge with one from the same series, in this case a GBPC 810 which conveniently is the same mechanically, but with a PIV rating of 1000 V,\ (incidentally the 1000 PIV bridge is roughly 30% cheaper than the 600 PIV bridge, and no, I do not know why either!).

After some repair work and a steep learning curve, I can now retire the old shack power supply and replace it with one not that much larger but of at least twice the capacity.

If I total what it cost me in terms of the hip pocket, I would have to agree with some of my usual brians trust members who have told me that there are cheaper alternatives, but at least this way I have learned something!


## Acknowledgements:

A lot of the approaches I have taken while testing and repairing the PS-30 were prompted by discussions with some of my usual suspects from the drive time net on the Melbourne 438.075 MHz repeater and their suggestions are gratefully acknowledged.

The internet articles by Adam Farson VA7OJ/AB4OJ, on adjusting the PS-30, and Ernesto Lastra Bohme DF1ELB, on fixing a problem he had found with his PS-30 are also gratefully acknowledged.

I would also like to acknowledge the suggestions of my boss, Ralph. The coffee has also helped!


ar

# A simple two element 'Strip' Yagi for fox hunting or other applications

Felix Scerri VK4FUQ

**I recently had the opportunity to go 'fox hunting' (hidden transmitter locating), and I was quite keen to attend, however there was one small problem. Although I had a suitable 2 m hand held, I had no suitable directional antenna!**

Then a flash of inspiration! Some time ago I had 'partially' built a two-element 2 m Yagi for test purposes which was never properly finished. Thus inspired, I spent a few hours finishing this little antenna and I got it ready for fox hunting duty. Its design borrowed directly from my earlier three and five-element 'strip' Yagi designs, which performed exceptionally well.

This little two-element Yagi is perhaps the 'absolute minimalist' version of my strip Yagi series, simply consisting of a driven element and a reflector placed at a distance 0.2 of a wavelength away (see Photo 1); theoretical forward gain is around 4.5 to 5 dBd. Using a gamma match, I matched the antenna to a short length of RG58 coax at 146.3 MHz and it was ready to go fox hunting!

I had never really participated in any radio 'fox hunt' before, so it was going to be interesting! The day of the fox hunt arrived and I was pleasantly surprised at how well things turned out. The little two element beam had quite a clean directional pattern in practice, with especially deep nulls off the back and sides. It was actually quite easy to rotate the beam through 360 degrees (at different polarisations), then look for the deepest null off the back of the beam and simply note the reverse direction by 180 degrees for the true direction of the 'fox'. In the end, although I was not the first to find the 'fox', it was much easier to find than I had expected! Overall, I was quite happy with this little two element 'strip' Yagi.

Although this antenna was built expressly for 'fun' fox hunting activities, it has since occurred to me that it could have value in extending the range for portable and/or base applications. Whilst a larger Yagi with more (and carefully tuned) directors will obviously have greater gain, this very compact and diminutive two element version provides around 5 dBd of forward gain. This is equivalent to doubling, and a little bit more, on both transmit and receive, which is very worthwhile given its small size! Indeed, when fully assembled, it easily fits into the boot of my Mazda 3 sedan, while the larger three-element version will not, unless completely disassembled!

So its value is not limited to purely fox hunting applications!

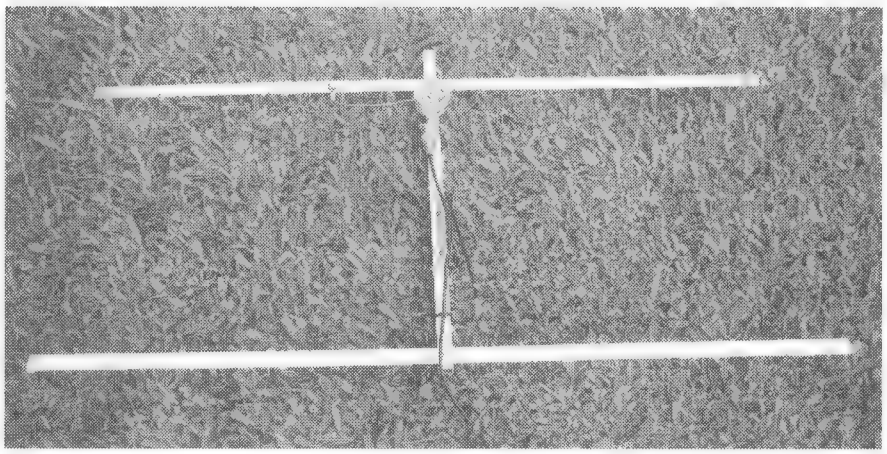

Photo 1: Two-element strip Yagi antenna

## The VK4FUQ two element 'strip' Yagi construction data

| | |
|---|---|
| **Boom material:** | 19 mm aluminium box tubing |
| **Element material:** | 20 x 1.6 mm aluminium strip |
| **Driven element length:** | 980 mm (38.5 inches), for the 146 MHz range |
| **Reflector element length:** | 1020 mm (40.25 inches) |
| **Spacing:** | 410 mm (16.125 inches), measured 'centre to centre' from one element to the next |
| **Matching System:** | Gamma Match. Tapping point 140 mm (5.5 inches) from centre, capacitor approximately 27 pF. |

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## CORRECTION

***In the article "A swept-frequency generator" by Paul Anderson VK2GPT published in the June 2008 issue of Amateur Radio, both the parts list and the circuit diagram on page 21 omitted the value of C7. Please note:***

**C7 4.7 uF Tantalum 35 V**

# A state gathering of radio amateurs in the Czech Republic

Vlad Sezemsky VK2EKO and Margaret Sezemsky VK2PSM

**A state gathering of radio amateurs was held at Holice, in the Czech Republic, on 24th/25th August 2007. This gathering not only included many Czech amateurs but also several from various European countries, from Canada and, for the first time, Australia.**

Holice is a town of about 6000 located in Eastern Bohemia near Paradubice, and has for some years been the centre for this gathering of amateurs. The Paradubice region is an area of natural beauty, an undulating landscape that is an attractive tourist destination as well as an historical centre. Holice surprised us with its African Museum, a memorial to Dr. Emil Holub, a 19th century explorer from Holice who travelled extensively in Africa, gathering a large collection of ethnography and natural science.

We were overwhelmed by the joyful reception extended to us, and it was a challenging exercise matching faces with voices that we had heard over the years; in the case of Jaroslav OK1NH, for 21 years. We were not very successful until they had something to say.

Accommodation had been arranged for out-of-town travellers in a recreation centre where we all had a chance to relax and socialise after the formal meetings had finished.

The chief formality was a sit-down meal with the Mayor of Holice, for about twenty amateurs plus the committee responsible for the organisation of the gathering. It was an occasion for speeches and an exchange of gifts. Our speaker Vlad VK2EKO thanked the Mayor for his welcome, commented on the historic nature of the town, which was established in 1340, and remarked that while Paradubice is an important and larger town, especially known to horse racing enthusiasts, Holice is more significant for us because it is the venue for the gathering of radio amateurs, several of whom we had been in contact with for twenty years. A 'coffee-table' book of Australia was presented to the Mayor as a memento of this visit; best wishes were extended to him for his good health and successful tenure of office. In return he presented us with souvenirs of Holice.

The next day was an occasion for informal meetings scheduled in smaller meeting rooms, and on a roster basis. Australia was first on the roster, and this provided an opportunity for us to pass on greetings from Emil VK2FHC, Vojta VK4AXM, Standa VK3PSR and Karel VK4CWS, and to discuss equipment and the hobby in general, and to exchange souvenirs.

Among those present was Jaroslav OK1NH, who was a radio officer on the ship 'Vltava' when first contact was made with him on 21 June 1986. Others we met were Vladimir OK1ATQ, Pavel OK1KZ, Jaroslav OK1TC, Ondra OK1TKO, Libor OK1WS, Josef OK1AB and his wife Jana OK1UB and Ivan OK1MOW, who was involved in organising the gathering.

Altogether it was an exciting and rewarding visit. Thanks go to the organising committee, and especially the amateurs who welcomed us and took care that we met as many people as possible, and experienced the spirit of the occasion as well. The only regret is that Holice is so far away, and is unlikely to be on our itinerary again any time soon.

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Photo 1: Vlad VK2EKO meets Jaroslav OK1NH, after 21 years of on-air friendship. Margaret VK2PSM looks on.

Photo 2: Meeting members of the welcoming committee – Ondra OK1TKO, Josef OK1AB, Vladimir OK1ATQ, Vlad VK2EKO, Jana OK1UB and Margaret VK2PSM.

Photo 3: Vlad VK2EKO visits one of the stalls at the gathering.

## International Lighthouse/Lightship Weekend

# It all started on a wet wintry evening...

Kevin Mulcahy VK2CE

**It all started in 1994 during a wet wintry evening when two members of the Ayr Amateur Radio Group in Scotland, John GM4OOU and the late Mike GM4SUC, were talking after a club meeting about creating an event in the summer when club members could get out on a sunny weekend and play radio. Various themes were considered; ports, airports, historic Scotland sites, the Firths of Scotland, castles etc. but it was finally decided that lighthouses of Scotland would be ideal.**

Following research it was discovered that the lighthouses of Scotland were controlled by the Northern Lighthouse Board in Edinburgh who were not only responsible for the lighthouses of Scotland, but also around the Isle of Man. Approval was sought and obtained from the Northern Lighthouse Board to establish amateur radio stations adjacent to their property. In February 1995 an invitation was sent to all Scottish clubs and the Isle of Man club to join in the fun of a weekend, to be called the Northern Lighthouse Activity Weekend, by establishing an amateur radio station at a lighthouse during the third weekend in August. This first year's event saw 11 stations established at lighthouses, operating primarily on the HF bands, with each station making approximately 750 QSOs over the weekend.

The following year, the Scottish clubs were involved in a weekend activity with the theme of Scottish Firths (river estuaries), so two years elapsed before the next Northern Lighthouse Activity Weekend. During this period Anne-Grete OZ3AE enquired through a letter to Practical Wireless if there was any lighthouse activity on amateur radio. Following discussions with her it was decided that Danish stations could join in the fun of the weekend. Quickly Germany, South Africa and France asked to join, so the name of the weekend was changed to The International Lighthouse/ Lightship Weekend. It was at this time that John, GM4OOU, due to pressure of work, had to cease his connections with the event.

The weekend became an annual event taking place over the third full weekend in August and has slowly grown in popularity. In 1999 there were 204 lighthouse/lightship stations in 36 countries and by 2007 380 stations in 43 countries took part. Full statistics and guidelines for participation can be found on the ILLW web site at http://illw.net

The main reason the event has become so popular is because it is NOT a contest. It is a relaxed fun weekend without the pressure of a contest. The guidelines are simple and the onus is on the operators to act within the spirit of the weekend which is simply to expose amateur radio and the plight of lighthouses to the public. This is why it is important for the ham station to be as close to the lighthouse/lightship as possible and with the controlling body's approval.

A few years ago the International Association of Lighthouse Keepers decided to have an annual open day for lighthouses all around the world to encourage visitors to visit at their lighthouses. They decided that no better day could be decided upon other than the Sunday of the ILLW. This move has been highly successful as the media have become involved in quite a few of the countries involved in the event.

This year's event takes place on 16-17 August 2008, so if you have not done so already, find a lighthouse nearby and get a group together or do it solo and fire up a lighthouse station. In most cases if you do not intend operating from within the lighthouse itself or one of its cottages, you really do not need to get any approval. Most first time entrants are so enthused with the event that they return year after year. A report from the Burlington ARC, Canada, summed up their first participation in these few words:

*The greatest delight of the day was the active participation of the visiting children who showed a remarkable interest in the whole idea of amateur radio, especially the use of Morse Code. It was an honour and a delight to participate in this adventure and we look forward with increased enthusiasm to next year's participation.*

As you can see from the website, Mike Dalrymple passed away in December 2005. He was the Treasurer of the Ayr Amateur Radio Group and one of their members has taken on Mike's role as the PR man and main co-ordinator. The event is now dedicated to Mike's memory, as is the official web site http://illw.net, where you will find the event guidelines, an on line entry form and lists of participating lighthouses since 1999.

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# An LF receiving converter with loop-stick antenna

Drew Diamond VK3XU

**Interest in exploring low frequency (LF) techniques has been re-kindled in this country by the likely approval for Australian Advanced amateur licensees to use 135.7 to 137.8 kHz (2,200 metres) for narrow-band modes.**

Unfortunately, most households and/or neighbourhoods are now enveloped in an 'electronic smog' of spurious noise plus a galaxy of harmonics from a multitude of switch-mode power supplies and other appliances. Rather than use the main transmitting antenna for receiving, much better results should be obtained where a loop, either 'frame' style, or ferrite rod (loop-stick) is used. Such antennas possess a deep null in their response that usually permits the worst of these noise sources to be placed 'in the null', and so obtain a substantial improvement in signal to noise.

A significant reduction in noise may be had by making the converter self-contained and battery operated, with no electrical connection whatsoever with the AC mains (which conducts, and re-radiates noise into the shack environment). For a loop-stick antenna, a further decrease in mains-born noise pick-up is obtained where the antenna is located more than a one metre or so from mains operated devices.

Offered here is a simple, sensitive receiving converter that allows an ordinary HF receiver - one that tunes the 3 or 4 MHz bands - to be used as a 'tuneable IF'. Hence, where a signal on, for example, 137 kHz is tuned in, it will be 'up-converted' and appear on 3,137 (or 4,137) kHz.

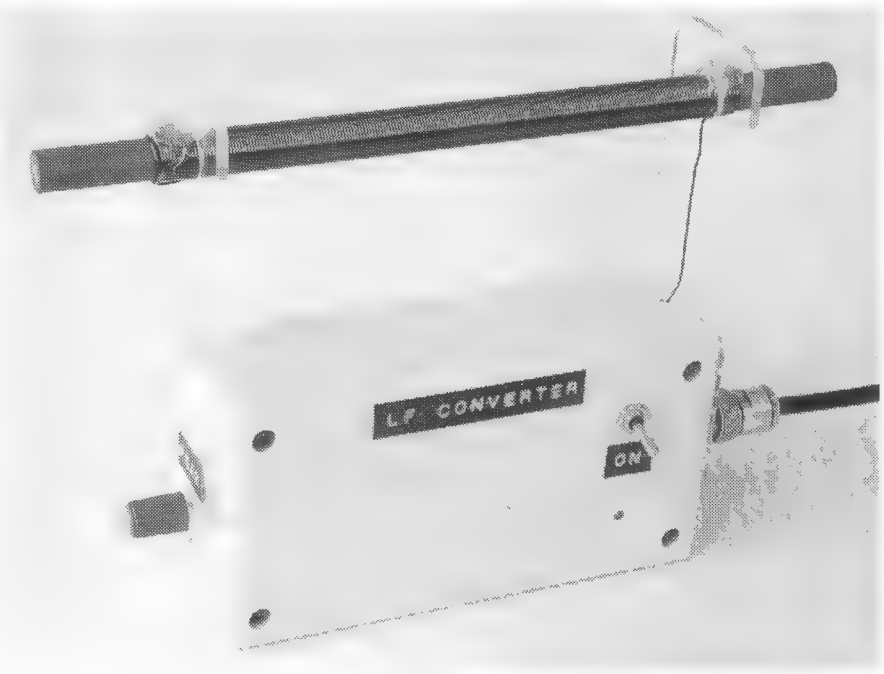


Photo 1: The LF receiving converter with loop stick antenna.

## Circuit

See Figure 1. The loop-stick's self-inductance, about 2.4 mH, is resonated with a variable peaking capacitor adjustable from (about) 20 to 800 pF. This gives a tuning range of around 110 to 290 kHz, thus also providing access to some of the navigation beacon signals above 200 kHz - a handy feature for appraising the converter's capabilities.

The amount of signal energy available from a loop-stick is much less (about 20 dB) than obtained from a long wire antenna (References 1 - 6). Amplification of the loop's voltage is therefore required, partially provided in this instance by a 2N5484 FET common source amplifier. Thus, very little loading of the antenna circuit occurs, so the natural 'Q' - and hence selectivity - of the antenna is maintained. This feature greatly attenuates any (possible) intermodulation-causing signals that lie either side of the resonant frequency (a characteristic that is absent from a 'general-coverage-receiver-and-long-wire' set-up, for example). The 100 pF ceramic capacitor between gate and source discourages any strong local TV or FM signals from entering the amplifier.

A popular NE/SA602 mixer chip and on-board crystal-controlled oscillator heterodynes the LF signal up into the 3 (or 4) MHz band. The '602 also provides about 15 dB of conversion gain. A conventional broadband transformer couples the 1.5 kilohm balanced output of the '602 into 50 ohm coax cable, thence to the input of an appropriate receiver. The crystal frequency is accurately adjusted to 3.000 (or 4.000) MHz so that exact knowledge of the input frequency is assured.

## Construction

The prototype model, pictured in Photo 1, is housed in a plastic 'jiffy' box measuring 130 x 67 x 40 mm. The variable capacitor, amplifier and mixer chip are accommodated upon a 'paddyboard' circuit board (Reference 7) measuring 100 x 50 mm, although any preferred construction style, even 'ugly', should serve, provided that component leads are reasonably short, and the general layout shown in Figure 2 and Photo 2 is followed.

The SA/NE602 may be fitted into an 8-pin DIL socket that is, in turn, soldered upon a 'substrate' pad of circuit board, segmented as shown. The angled cuts are at 65 degrees to the centre line of the chip. The substrate and pads may be fixed, copper side up upon the circuit

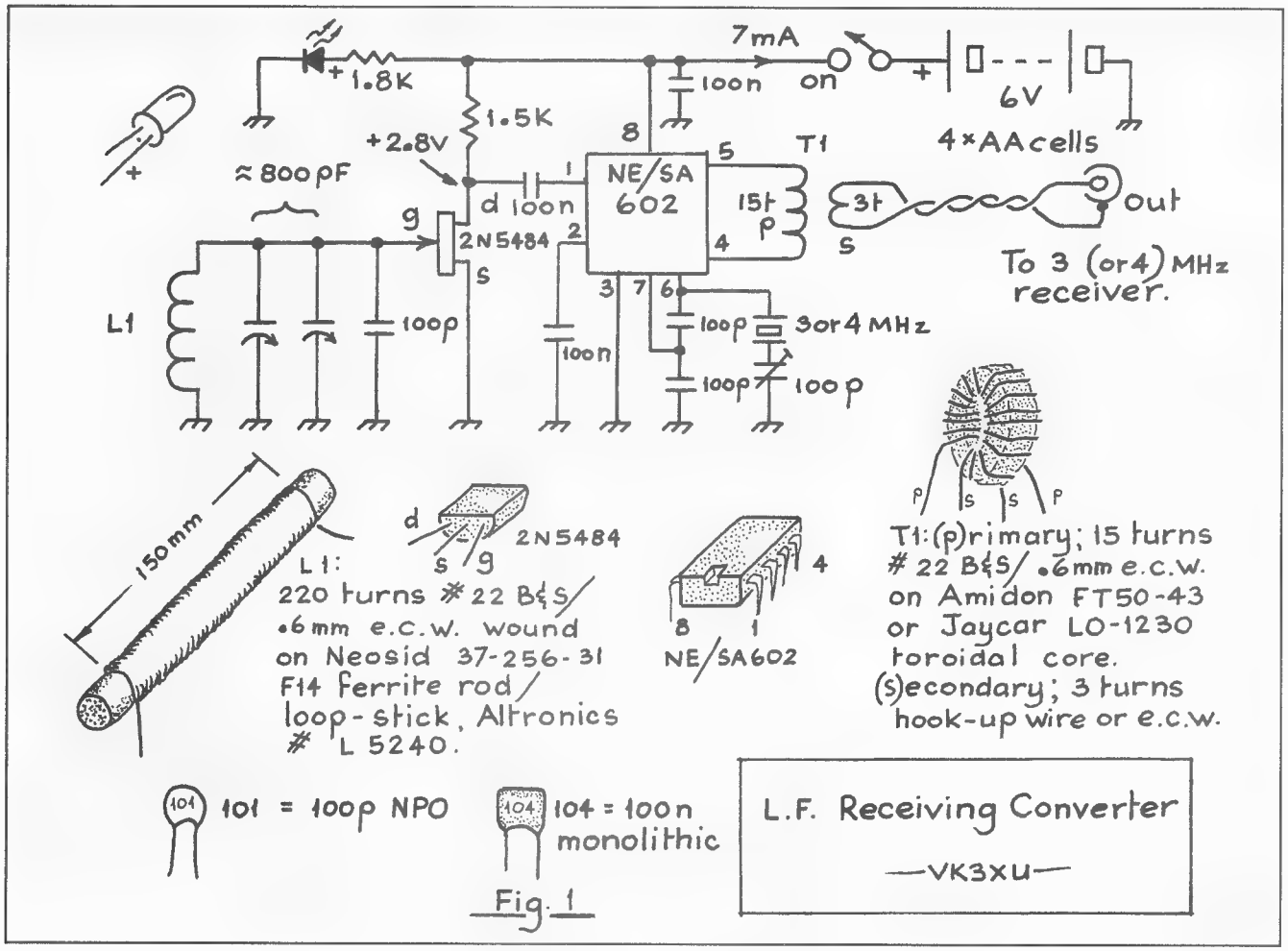


Figure 1: Schematic of the LF receiving converter.

board, with just a dab of super glue.

Or consider using hot-melt glue. In this case apply a sliver of solid glue upon the underside (fibre) of the pad, then apply your soldering iron tip to the glue and melt it evenly. Quickly place the pad on to the board in the exact spot required. A 'handle', such as a 3 A diode, may first be temporarily soldered to the pad as an aid to this procedure.

To achieve best 'Q', the loop-stick should be distanced from metal objects by more than about 50 mm. 3 mm Perspex or acrylic sheet is an ideal material for mounting the rod above the box, as illustrated in Photo 1.

For the antenna coil, close-wind 220 turns of #22 B&S/0.6 mm enamel coated wire (ecw), with a winding length about 150 mm, upon a Neosid 37-256-31 F14 ferrite rod. The coil ends may be temporarily anchored with a small piece of sticking tape. Upon final assembly, the rod is passed through a slightly over-size hole in each of the Perspex sheets. A dollop of hot-melt or epoxy glue should be applied to the interface between the coil and the Perspex. Later, with care, the tape may be removed and replaced with a small blob of glue to secure each end of the coil.

The four AA cells for the 6 V battery supply may be accommodated in a 4-cell holder (eg Jaycar P/N PH 9204), attached with hot-melt glue to the lower rear of the jiffy box.

## Operation

Carefully inspect your soldering for quality and accuracy. Confirm that the FET, NE/SA602 and the 4 x AA cells are correctly installed.

Connect the converter's output to the receiver input using a suitable length of 50 ohm coax cable. Switch on, and tune your receiver to about 230 kHz (3.230 [or 4.230] MHz on the receiver's dial). Adjust the loop variable capacitor for a pronounced peak in noise, then find a navigation beacon signal, re-peaking the capacitor as you go. The set-up should sound lively (or 'gainy'), indicating that the converter is probably working correctly. You should be able to substantially reduce the (man-made) noise level by rotating the converter for lowest noise/best signal.

Now tune down to 'zero frequency' - 3 (or 4) MHz). Provided that the receiver's dial/readout is accurate, adjust the 100 pF trimmer so that the crystal oscillates on exactly 3.000 (or 4.000) MHz at 'zero beat'.

When the band is allocated to us in due course, amateur signals should be audible near 137 kHz.

## Parts

All of the ordinary electronic components are available from our usual electronics component suppliers, including Altronics, Electronic World, Jaycar, Rockby and Semtronics.

The preferred Neosid ferrite rod is available from Altronics, P/N L 5240. A

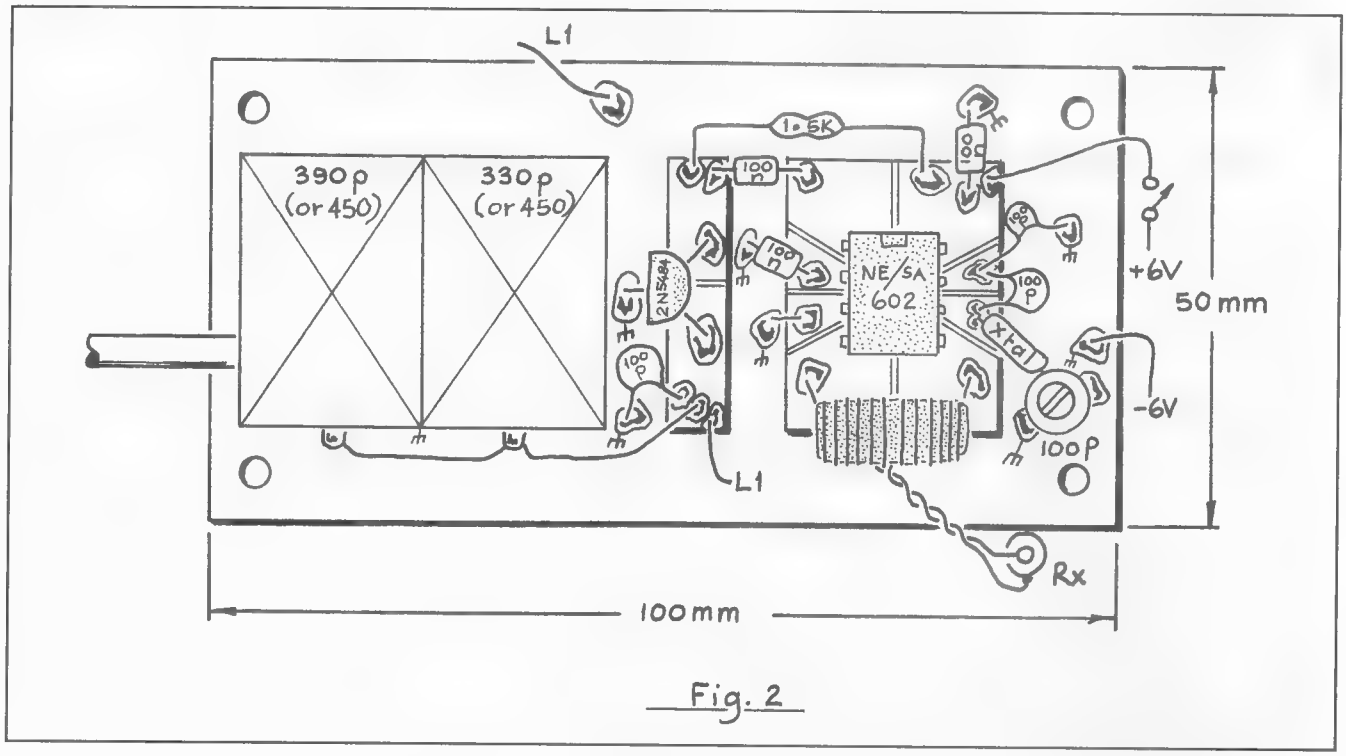


Figure 2: The general layout of the components in the plastic 'jiffy' box.

3.000 MHz crystal, P/N 13662, may be ordered from Rockby Electronics (www.rockby.com.au).

Unfortunately, SA/NE602s are not (normally) stocked by the usual suppliers (although Electronic World (03 9723 3860) have them in an SOIC [surface mount] package). Andrew Blight VK3BFA at Starlight Electronics (ph 03 9802 3421) can supply single '602s to amateurs at reasonable cost.

My plastic 'jiffy' box is a Jaycar HB 6023 (take care that your chosen variable capacitor will fit, together with the other circuitry).

The variable capacitor may be any miniature two (or three) gang broadcast type with a total capacity of 700 or 800 pF. The capacitor for the prototype (visible in Photo 2) is a beautifully made 330 + 390 pF 'Kopf' part, complete with anti-back-lash reduction drive, obtained at a local ham swap-meet at next to no cost. The fellow selling these was practically giving them away, so it is possible that you, or one of your radio mates, have one. It may be fixed upon the circuit board with four 2.5 mm (preferably brass) screws inserted into existing pre-tapped holes, where the screw heads provide four solderable anchors.

If you enjoy the same good luck as this writer, a bundle of 3 mm Perspex (acrylic) sheets may be obtainable from the off-cuts/scrap-bin at your local plastic sign makers, free for the asking.

Should you have genuine difficulty in locating an item or two, do please write (or 'phone on 039722 1620). I am not in the parts business, but I usually have spares on-hand, or can suggest a source.

## References and Further Reading


1. 'The loop aerial revived'; R Schemel, *Wireless World*, July 1975.
2. *Foundations of Wireless and Electronics;* M Scroggie, p 291.
3. 'External Ferrite Aerial Units for Short, Medium and Long-Wave Radios'; R Q Marris G2BZQ, *Elektor Electronics*, May 1993 (Richard Q. Marris has written many articles about loop antennas).
4. 'A Giant LF Loopstick'; R Q Marri, G2BZQ, *QEX*, March/April 2000.
5. 'LF and VLF Converter'; R Haigh, *Everyday Practical Electronics*, July 2005.
6. *Radio Communication Handbook; RSGB*, LF chapter (10) in recent editions.
7. "Paddyboard' Circuit Construction - Revised'; *Amateur Radio*, May 2005.


**Photos: Karlen Dockrey**

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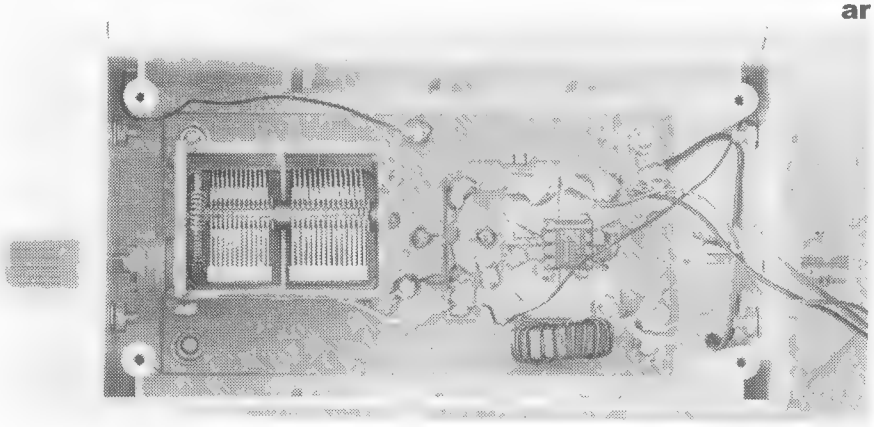

Photo 2: View inside the 'jiffy' box with the lid removed.

# When one can't see the forest for the trees

Felix Scerri VK4FUQ

**Yes, there is an aspect of 'humble pie' to this story but I have decided to tell it anyway, a simple story of not being able to 'see the forest for the trees', or an inability to realise a very basic long-term error.**

For some years I have had weekly skeds with an amateur friend of mine in VK3 on 20 m. Over the years we have had many excellent skeds with good signals in both directions, despite both of us using basic single-element antennas. However in recent times this 'path' had become poor and many of our weekly contacts had been essentially non-existent.

As a consequence, I had been giving much thought to improving my 20 m antenna set-up. One recent Saturday after lunch, whilst having a doze and staring at the Amateur Radio Map of the World, it occurred to me that perhaps my inverted V dipole was not really 'looking' at the VK3 region at all, as I had previously thought that it was. Well, it was not! It was firing essentially to the SE and NW from this location in Northern VK4 and was skirting the edge of the VK3 region, a long way from the intended target, which was confirmed by a couple of basic compass bearing checks. I quickly ventured down to the backyard and reorientated the inverted V to 'look' due south and due north. Before I did so, I noted as a reference the signal strength of Radio Australia on 15.240 MHz from the Shepparton transmitter, with the 20 dB attenuator in circuit. It was 5 dB over S9. After re-positioning my inverted V, the Radio Australia signal was now at 15 dB over S9, a definite improvement!

I sat there for a few minutes as the significance of this sank in. In a flash of inspiration I decided to re-install my wire 20 m Quad loop, as the inverted V in its 'new' position was no longer an obstruction. The Quad loop was hauled up the mast in a few minutes ('Murphy' was obviously away for the day), and then I did more receive tests. Radio Australia was still at around 15 dB over S9 on the Quad loop. I made a quick phone call to my friend in VK3 and arranged a contact on 20 m.

The result: despite poor and disturbed propagation (a 'K' index of 5), a good solid contact at a 100 watt SSB power level with no problems, and with the S meter indication at both ends 'well up' throughout the lengthy contact. I was quite happy, as one might expect.

The whole incident has been a real eye-opener as I had not properly appreciated the importance of correct aiming, even of a basic single-element antenna. One does not ordinarily think of a single-element antenna as a 'directive array'. An 'array', perhaps not, but 'directive', yes! I had always assumed that a single-element antenna's radiation pattern was broad enough to be relatively non critical. Well, yes it is; but there are limits! The Quad loop actually does have a slightly sharper pattern, with deeper nulls 'off the ends' than a dipole, making optimised positioning even more important.

**VK4FUQ learns to appreciate the importance of correct aiming**

Since that fateful day I have rethought many aspects of this general situation and why I had not properly appreciated it before. My other antennas for HF are separate inverted V dipoles for 40 m and 80 m. Because they are physically quite long, at this QTH they fit in the backyard pretty much as dictated by the available space. For this reason they run essentially in the N to NE, and S to SW directions, firing broadside to the wires, yet they give excellent coverage to the desired VK target area as evidenced by my weekly 40 m Sunday morning WIA news broadcasts. This, despite them being poorly positioned and firing mostly east (out to sea) and west; in theory anyway. Why? Well, it is worth remembering that inverted V antennas tend to have a somewhat more omni-directional pattern than true horizontal dipoles, and that when such dipoles are on low HF frequencies and close to real 'Earth', this tendency is exacerbated. A big blob of radio frequency energy going just about everywhere, and up, is the main result. Twenty metres is a band where perhaps these omni-directional effects are substantially reduced, making more precise positioning more important and practically mandatory. Well, it certainly works out that way in practice at this QTH!

Well, my 20 m Quad loop is still up and whilst I am still not totally convinced that it is noticeably better than my half-wave inverted V, for various reasons such as 'effective height' considerations, it is working very well in practice. I have to concede that it does have some unique virtues such as excellent noise cancellation, not only on 20 m but also when used as a general coverage 'receive' antenna which, as a keen SWL, I find a most desirable quality. Especially on the lower short-wave frequencies and the AM medium-wave broadcast band, this noise cancellation and the resultant improvement in 'listening' S/N ratio has to be heard to be believed. For this reason as well as its good performance on 20 m, I think I might leave it up. I admit to having a considerable aversion to noise of all kinds!

Although in some ways I am a little annoyed at how silly this error was, thankfully the antenna is still worked quite well despite its non-optimum positioning for the VK3 region. Sometimes I think that it might be preferable if things simply did not work at all when they are not right, rather than 'sort of working, after a fashion'. But perhaps I should not be too annoyed, as this sort of thing happens in life all the time, or so I am told. Hi.

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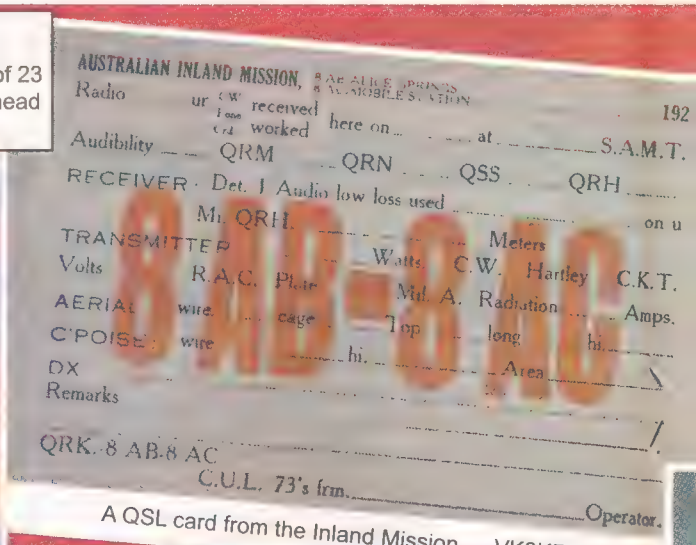
# Views from Broken Hill

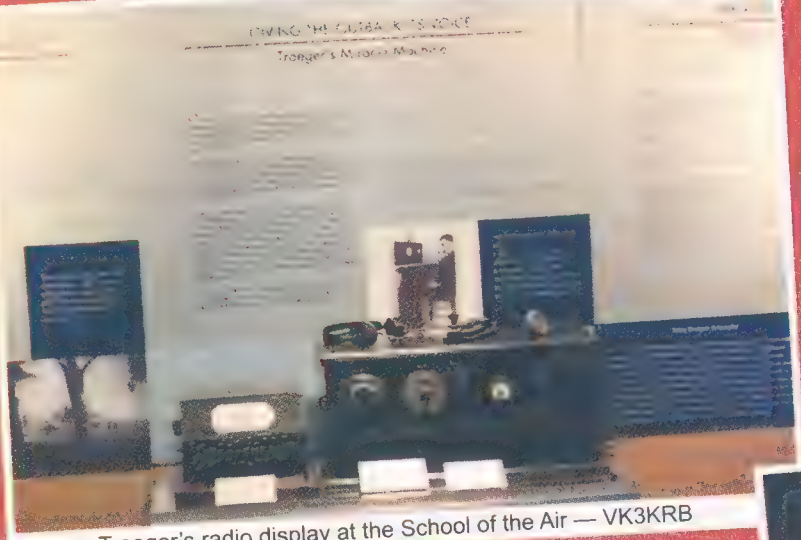
Photographs from the WIA AGM activities in Broken Hill on the weekend of 23 to 25 May 2008. Photographs by Peter Freeman VK3KAI, Robert Broomhead VK3KRB, Ewan McLeod VK4ERM and Christine Taylor VK5CTY.

Playing 144 MHz SSB at dawn, just south of Broken Hill — VK3KAI




A QSL card from the Inland Mission — VK3KRB

Michael Wright VK5ARD receiving his President's Commendation certificate from Michael Owen VK3KI — VK4ERM



Traeger's radio display at the School of the Air — VK3KRB

Traeger radios advance to SSB — VK3KRB

Michael Owen VK3KI conducting proceedings at the AGM. Peter Freeman VK3KAI, Phil Wait VK2DKN and Trevor Quick VK5ATQ prepare for the next items on the agenda — VK4ERM

Some of the crowd at the lunch at Lions/Rotary Park on Saturday — VK4ERM

NZART visitor Stuart Watchman ZL2TW presents a book to Robert VK3KRB, for his efforts in planning the AGM activities in Broken Hill — K4ERM

Well known Broken Hill artist and outback traveller Jack Absolom emphasizes a point during his after dinner oration — VK4ERM

The building housing Radio 2BH, styled after a classic broadcast receiver — VK5CTY

Some of the ALARA YLs gathered at the Lions/Rotary Park, near the relocated Kintore headframe of the Central Mine — VK5CTY

Part of the collection of historical radio receivers at Radio 2BH — VK4ERM

# News from VK2

**Tim Mills VK2ZTM**
c/- arnews@tpg.com.au

**The Central Coast ARC** adopted a new constitution and standing orders at a special meeting on the 18th April. Their 2009 Wyong Field Day is on Sunday 22nd February, subject to confirmation. Their AGM was last month.

**The Mid North Coast ARC** recently commissioned a 70 cm repeater at Dorrigo. Callsign is VK2RMG. Frequency is 438.125 MHz with a 123 Hz CTCSS tone. The next project is a 2 metre service linked to 70 cm, followed by a 6 metre system. Planning is well under way for the Radio Expo on Sunday the 18th January 2009. The MNC group produces a range of kits, the sale of which helps fund the repeater development. Check their web site www.mncarg.org

**The Illawarra ARS** celebrated their 60th anniversary last month – including the special callsign VI2AMW60. They currently provide technical workshops with a range of projects, including kits of parts. Check it out at www.iars.org.au They have a news session on Tuesday evenings – other than meeting nights – on the Coast linked repeater network. The anniversary dinner is moved to the 28th June from the earlier announced date.

**The Oxley Region ARC** conducted their annual field day over the June long weekend. They are now back in the routine of the monthly meeting on the first Saturday afternoon with the informal second and fourth Friday evenings at the Port City Bowling Club, Owen Street, Port Macquarie. They can provide Foundation and Standard classes and exams in the Port Macquarie and Wauchope regions. Inquire to P.O. Box 712 Port Macquarie NSW 2444, or check out their website www.orarc.org

**PLAN AHEAD**

**MID NORTH COAST AMATEUR RADIO GROUP**

**RADIO EXPO**

**COFFS HARBOUR NSW**

**SUNDAY 18TH JANUARY 2009**

**20 EXHIBITORS PLUS**

**ENTRY ONLY $5.00**

**Waverley ARS** had to shift their annual auction to the 12th July as notified in AR last month as the Scout hall has other users other than during school holidays.

**The Hunter Radio Group**, formerly Hunter Branch of the NSW Division, meet on the second Friday evening at the local NBN TV studios. There is a news net Monday evening at 7.30 pm, 80 metres – 3593 – and local VHF and UHF repeaters.

Next month – 10th August - will be the SARCFEST of the Summerland ARS at Richmond Hill. They are seeking two more area amateurs to become assessors. Contact Ian VK2IGS or Duncan VK2DLR for details.

## ARNSW

The office bearers for the ARNSW 2008/09 year were recently decided. Norm Partridge VK2TOP is the President and will also look after Membership and Affiliated clubs. Senior Vice President is Beth Langley VK2AO, with duties at the Dural property. Junior Vice President is Terry Ryeland VK2UX who also has education. Secretary is Michael Corbin VK2YC, also the role of Public Officer, Deceased Estates and will oversee building development. Brian Kelly VK2WBK is the Treasurer. Mathew Magee VK2YAP is looking after broadcasts and Dural engineering. Brian Keegan VK2TOX is Web Master.

The last Sunday this month – 27th – is the next Trash and Treasure and Home Brew gathering at the Dural property.

Beth VK2AO, on behalf of ARNSW announced a DXpedition as part of the celebrations leading up to the 100 year celebration of WIA NSW. To quote from the news release on VK2WI news on the 8th June:

*For the information of those interested in DX expeditions and who are current members of ARNS, we are looking at staging a number of DX trips across Australia over the next 18 months with the intention of setting up HF radio sites over long weekends and a long trip with a four week travelling expedition to a number of destinations as part of the 100 year celebration of WIA NSW.*

*If you want to be part of an expedition or a support site or can assist in some other way please get in touch. These trips will need a team of dedicated people if they are to be successful. If you are an F call, a Full call or somewhere in between then this is the chance of a lifetime.*

*We cannot do it without help so we would be interested to hear from anyone who would like to participate. If you would like to be part of fun then call Beth VK2AO on 0413 155 531.*

**Advised by Beth Langley VK2AO**
Vice President ARNSW.

A major posting of ARNSW renewals went out last month. There is a problem with any renewal being FAXed back to 02 9651 1661. The machine does not like the dark paper of the form. If you wish to FAX - down load a form from the ARNSW web site onto a light coloured paper. Membership of ARNSW is now available for either 2 or 5 years.

73 – Tim VK2ZTM

## 40 years ago ... continued.

You may have noticed the Editorial Comment last month about the gremlins in some text. Well, something also happened to the last part of the article last month. A line about the Waverley ARS found its way into what should have just said .. Another meeting occurred in July 1972 in Albury. ...

Well, that meeting took place with a good attendance. The agenda was to introduce more channels on 2 metre for the many systems then on line or waiting. There was also a proposal to shift the frequencies from being centred across 146 MHz to all above 146. A reason offered was that the international Amateur Satellite Service was assigned the couple of hundred kilohertz from 146 down.

This was a VK3 proposal and VK2 did not like the idea. The meeting did agree to expand the channels to be available by bringing in the previously withheld Ch 2 and 3 and adding three more on the 50 kHz spots between the existing four. These were to be known as Ch 5, 6 and

7. The new plan would be between 146 and 147 MHz with a - 600 kHz offset – a plan by then operating in the USA. Our plan made use of the inputs already in operation. To protect the satellite service, simplex operation was to move from 146 to the [present] 146.500 region.

Back in VK2 feelings ran high, the locals disagreed with the outcome of the meeting and they were not moving, said a vote of 216 to10 at a Sydney meeting – on the 1st April 1973. While the rest of Australia embraced the new allocations, VK2 spent the next 18 months sitting tight, becoming isolated and lonely. A further meeting in November 1974 reversed the opposition to the new plan by a margin similar to the earlier rejection. It was then full steam ahead to untangle the local channel congestion.

After that, it was not long before more channels were needed, so there was movement to above 147 and then the 25 and 75 points in between. Now, in many major population centres and some country regions there is not a spare channel. The introduction of D-STAR has required some systems to be allocated 12.5 splits.

While the Australian system was based on 25 kHz channel spacing, the Americans were at 30 kHz. In their plan 147.000 is a top megahertz allocation with + 600 offset, where as we treat it as a - 600 offset, which confuses some radios.

The next band to become available for repeater operation was 70 cm. Planning was somewhat determined by existing use. It had to be within 430 to 440. It had to avoid the 435 to 438 MHz Amateur Satellite Service and not intrude into the narrow mode segment at 432 MHz.

Some Europeans had chosen a 1.6 MHz offset in the 433 to 435 MHz portion. Others used a 7.6 MHz offset. Region 1 was at the disadvantage of having to fit all its operations, including ATV in the 10 MHz allowed between 430 and 440 MHz. We chose a 5 MHz offset to be either side of the satellite portion. The Americans chose above 440 at 5 MHz offset with various regions opting for high or low input, at times causing some interesting repeater lockups. For a short while there was local interest in adopting the European 1.6 MHz offset. Due to problems posed by LIPD and other 'low power' devices and systems in our input region 433 – 435 MHz, some repeaters at the low end of the segment can have a 5.4 MHz offset which puts the input below the portion of interference. Many others are having to fit CTCSS encoders.

The early repeaters had either a 25 or 75 channel. In the planning stages – when the first 7 channels in two metres had been introduced - some pointed out that the third harmonic from a two metre radio transmitting in the 146 MHz portion to access a two metre repeater would fall on either a 00 or 50 channel on 438 MHz and up on 70 cm. Some wanted the planning to avoid a possible feed back loop by not allocating channels ending in 00 or 05.

The future of 70 cm could be difficult with the ACMA interest in all of this UHF spectrum. The loss to ATV and some linking in spectrum below 432 MHz has impacted on some activities.

After these (more) primary bands – 2 and 70 – others were more routine. At 23 cm, the first plan was based on a 12 MHz offset to be clear of the airport radars that were centred on 1275 MHz. When they went, the offset became 20 MHz in the 1270 to 1290 region. On this band the 1260 portion is Amateur Satellite Service and like on other bands - terrestrial based activities have to avoid these segments.

Six metres is a 1 MHz offset system of 16 channels. This band, with its ability to open into other regions, has to be planned on a national basis to select channel reuse on the least likely skip distances. This plan made one channel available – almost exclusively – to a call area and the balance [8] on a reuse anywhere.

Ten metres is a problem as it is world wide with only (nominally) four channels and a 100 kHz offset. It is a matter of reuse to the best advantage. It is almost impossible to operate the repeater's receiver and transmitter at the same site.

The planning of all the spectrum for repeater and other mode operation over the years has seen heavy involvement by members of the Amateur Radio Service. What we have is what the users generally want. In any future planning of any aspect of the hobby, be involved; offer your opinion and suggestions. Do it at local, club or national level. It is always evolving as new modes and methods put a demand on our spectrum space, just like the commercial world.

40 years down the track and much has changed. Some consider that the heyday of the repeater is over, others might say it is just beginning with new features like IRLP and D STAR.

Let us review it – 40 years down the track in 2048.

# VK5

## Adelaide Hills Amateur Radio Society

At our regular meeting in May we had a very interesting talk given by Arthur VK5AZY about EMR associated with large installations (North West Bend in VK6 was one of them). He had some of the specialised devices used to make measurements of radiation strengths, everything from a small hand-held meter to a large recording instrument and some interesting tales to tell.

The talk was illustrated by marvellous photographs of outback Australia. Sometimes you feel very small and insignificant!

Within AHARS excitement is growing as we plan for the bigger and better Buy and Sell in November. Remember to put it on your calendar.

If you are in VK5 be sure to listen in to the regular Sunday morning broadcast, immediately after the National session. AHARS and most of the other clubs have a news item about their future activities.

# News from

# VK3

Website: www.amateurradio.com.au
Email: arv@amateurradio.com.au
**Jim Linton VK3PC**

## Amateur Radio Victoria News

### AGM

The AGM on Wednesday 21 May was well attended by members including those who had travelled some distance from country areas.

The annual reports issued, and available on the website, detailed the operations and activities of the state-wide organisation for the 12 months to December 2007.

As Chairman, I was pleased to announce that John Brown VK3JJB, who had served six years as Secretary and was also the office administrator, had been found most worthy of recognition. John had retired as Secretary and office manager in 2005 in order to travel, but has continued part-time voluntarily.

The council relied heavily on his knowledge to get a number of things done. His suggestions toward improving the computer systems in the office made the upgrading work that much easier.

John did not always agree at the time with all of the decisions taken by his fellow councillors, it was noted, however that was not a bad thing and made everyone re-assess their views.

John Brown VK3JJB receiving his Life Membership certificate from President Jim Linton VK3PC.

The council does not believe that someone should merely be awarded recognition because they have served for a substantial period of time. Each individual is different. Other attributes considered include the contributions made to the well-being of the organisation and the legacy of their volunteer work.

John has worked consistently with the interests of the organisation and its members in mind. A humble John Brown VK3JJB, in accepting his Life Membership Certificate, said he was not expecting such an honour. The occasion obviously caught him by surprise.

The Scout Radio and Electronics Service Unit received the SW Gadsden Trophy in recognition of the enormously successful VI3JAM amateur radio activity at the 21st Australian Jamboree, Elmore, 2 to 12 January, 2007.

Our Event Coordinator, Terry Murphy VK3UP was also acknowledged for the contributions he had made since joining council. As a symbol of working towards the success of the now discontinued Welcome Aussie Foundation Licensees (Waffle) Award, Terry was presented with his personal award certificate.

### On air standards

The AGM saw operating standards and anti-social behaviour on the amateur bands discussed. This matter is being talked about elsewhere and on air.

A couple of radio amateurs who had returned to the hobby after an absence of many years claim that operating standards such as proper callsign use has slipped and the attitudes of some operators are less than friendly.

In 2006 some thought was given as to how best to encourage and recognise reasonable behaviour and that maybe a set of radio amateur guidelines or a code of practice would be useful.

The draft code contains the following:

- Recognise that the amateur radio community is made up of a diverse range of people with various backgrounds, abilities and other personal attributes.
- Support continued harmony within the amateur radio community, putting aside personal feelings and emotions.
- Encourage newcomers and the less experienced in a way that makes them feel welcome and supported to personally grow in the hobby.
- Do not knowingly cause interference or engage in any other activity that lessens the enjoyment of amateur radio for others. Not use amateur radio to offend other radio amateurs or listeners.
- Appreciate the history of amateur radio, from its beginnings when wireless was a scientific oddity through to its existence today in the information technology age.
- Recognise the traditions, operating practice, band plans and other self-regulated measures that achieve orderly participation on the amateur bands.
- And finally, to personally acknowledge that amateur radio is a privilege and not a right.

It remains as a suggested starting point to address those practices in modern day amateur radio that are unacceptable to the majority, or have not kept up with other positive changes in our society including tolerance, harmony and equity of access.

### Foundation class

The next weekend training and assessment sessions for the Foundation Licence will be 19/20 July and 23/24 August. Enrolments close soon. For inquiries or to enrol contact Barry Robinson VK3JBR 0428 516 001 or arv@amateurradio.com.au

### Looking ahead

All is set for Amateur Radio Victoria to again activate the Williamstown Lighthouse and Timeball Tower during the International Lighthouse and Lightship Weekend of 16 & 17 August.

Work has also begun on reviving the Keith Roget Memorial National Parks Award in time for the arrival of spring this year. That initiative follows inquiries from several members including one who has offered to be the award manager.

# Geelong Amateur Radio Club – The GARC

Tony Collis VK3JGC

## Recent Club Activities

### *The Design of Antennas by Computer Modelling*

Gerhardt VK3HQ gave a presentation on the theoretical design of antennas, from the derivation of formulae through to the use of MMANA_GAL, the free computer-based antenna design system designed by JE3HHT, DL1PBD and DL2KQ. This was particularly revealing in respect of the compromises necessary to produce a multi-band antenna with low angle radiation and matching it to a 50 ohm feed point. The program allows the user to try different feed points showing the resistive and reactive parts of the input impedance as well as the manner in which the radiation pattern changes with height above ground.

A number of these scenarios are shown on the VK3ATL web site at www.vk3atl.org and the tabled information can be directly plumbed into the MMANA-GAL program.

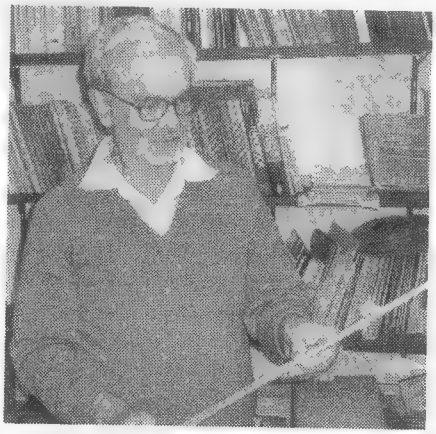
Gerhardt VK3HQ

### *The Design of Simple Antennas*

To compliment the presentation by VK3HQ, Peter VK3ZAV gave a presentation on building 'simple' antennas focussing on 2 m and 70 cm. These included stub matched verticals and the well known 300 ohm ribbon J-pole. In regard to coupling the transmitter to the antenna, Peter was at pains to point out that whilst the PL259 is a commonly used connector, unlike the BNC or N type connector, it has the potential of poor contact with the coax braiding as it is screwed into the socket relying on a pressure contact rather than being soldered.

Another issue highlighted was waterproofing the connector to stop the ingress of rain water into the coax, by using shrink wrap tubing. Water vapour can significantly increase the attenuation or losses within the cable by oxidisation of the braid or they may be incurred due to water absorbed into the dielectric, heating up when power is passed through the cable.

At the conclusion of the presentation there was a practical session where a number of these antennas were built by the members.



Peter VK3ZAV

### *The Geelong Museum Association*

A talk was given to the GARC by Beck Gurrie, Director of the Geelong Museum Association about her motivational plans to inspire members of the museum and interested organisations, to provide facilities in the museum to educate and promote awareness of the Geelong Regional Heritage. Beck explained that the museum only had about 10% of its exhibits on show at any one time but had a rotation programme to give them all an airing. Not all the exhibits are owned by the museum – a number are on loan from people in the Geelong area.

Amongst the events currently being sponsored by the museum are:

- Whisky Tasting
- A Radio Club Open Day – which the GARC will provide
- A 150th year anniversary dinner related to Osborne House
- A Seniors week in October
- A Heritage Festival in November

All the above and more can be gleaned via www.geelongmuseum.com or contacting Beck directly at geelongago@yahoo.com.au

Beck Gurrie

## The 60th Anniversary of the formation of the GARC

The club 60th anniversary plans are now well established, with the venue at the Geelong RSL. Amongst the guests invited is the President of the WIA Michael Owen VK3KI and Councillor Barbara Abley AM DSJ who represents Geelong's Brownbill Ward.

The guest speaker is David Tilson VK3UR. A few of David's activities have included:

- designing and managing the first Australian 10 m FM repeater,
- constructing and managing the Victorian end of the Aussat Satellite/amateur radio links for Jamboree Of The Air across Australia and New Zealand, which linked into various 2 m repeaters across Victoria,
- hosting Cosmonaut Musa Manarov U2MIR during his visit to Australia in 1992,
- Coordination of WICEN Victoria's response to major flooding in North Eastern Victoria in 1993.

David has managed the design and implementation of various satellite and microwave communication networks for the Department of Defence, setup and managed the information technology network for the Victoria State Emergency Service and recently was the Information Technology Manager and Infrastructure Manager for Rural Ambulance Victoria.

# News from VK7

**Justin Giles-Clark, VK7TW**
Email: vk7tw@wia.org.au Regional Web Site: reast.asn.au

May 18 saw the last VK7 Regional News broadcast that John Roger VK7JK read after 28 years of involvement. John has decided to give it a well earned rest and focus on other amateur radio pursuits. There was a tribute to John's involvement including a great history lesson of the VK7 Broadcast from the 1950s. Best wishes and thanks John for your years of dedication to this great hobby.

John VK7JK reading his last VK7 Broadcast

Congratulations to Robin Harwood VK7RH who was awarded the "Higginbotham Award" at the WIA AGM for his many years of dedication to contributing the Short Wave Listening column in this magazine. Congratulations to Steve VK7XOR, who was presented the Athol Johnson Trophy, and Tony VK7FACC who was presented with the John Grace Trophy by Rick Grace, the son of John Grace. Thanks also to Max VK7KY who crafted the John Grace trophy.

Please note there are linking changes to the Table Cape Repeater - VK7RAC. For more information take a look at: http://reast.asn.au/repeaters.php

The VK7 callbacks for the WIA National News year contributed 6160 check-ins to the VK total of nearly 98,000. The repeaters around VK7 accounted for a majority and 80, 20 m and UHF CB topping the rest of the list.

Steve VK7XOR and Tony VK7FACC both first time contesters!

## Northern Tasmania Amateur Radio Club

NTARC's May meeting was presented by Greg VK7YAD with a talk on ATV and proving that you can get into ATV cheaply using vestigial side band AM TV on 70 cm. The higher bands are also available cheaply by using old analogue satellite TV receivers or old Austar microwave "MDS" pay TV downconverting antennae.. Thanks Greg.

Congratulations to Bryn VK7FBAW who was awarded George Town's 'Volunteer of the Year' award, in recognition of his work with the Tamar Sea Rescue Association.

## WICEN Tasmania (South)

The weekend of June 15/16 saw WICEN South at The Lea scout camp for a field weekend of activities including - connector and cables, HF dipole building, NVIS trials using the WICEN 5MHz Frequencies, APRS and much more.

## Radio and Electronics Association of Southern Tasmania

REAST's June meeting was a professional presentation by our resident Physicist Mike Groth VK7MJ on all things antennae. Mike covered the basics, the designs and the theory in layman's language. Mike then summarised the presentation with some words of wisdom that I think all of us can relate to – "There Is No Magic Aerial!" Mike finished with transmitting a signal using a pair of free steak knives... HIHI. Pictures and a downloadable copy of the presentation are available on the REAST website.

**ar**

# Silent key

## Lloyd Cherry VK7BF

It is with sadness we hear of the passing of Lloyd Cherry VK7BF.

Lloyd worked for and left Telstra at the same time as Mike VK7FB. Since then he was involved in the Security Industry, both as a guard and installing and maintaining alarms, etc.

He lived on the side of the Huon Highway at Lesley Vale (some of you may have seen the tower and antennas) but has not been a very active amateur for some time.

He was also very involved in breeding and showing cats, among other interests.

Mike comments that "We called each other "book end mates" - BF/FB"

Vale Lloyd.

**Mike VK7FB and Bill VK7WR**

# VK6

Keith Bainbridge VK6XH
vk6xh@wia.org.au

## Who am I

First of all let me introduce myself. My name is Keith Bainbridge, and I am VK6XH. I have been licensed since April 1982, first of all in the UK as G6HHV and later as G0HEI. I emigrated to Western Australia in September 1987 where I received the call VK6BRK. It changed a couple of years later to VK6XH.

I was a member, first of all of the Hills Amateur Radio Group, and now of the Northern Corridor Radio Group, the latter for over 20 years. I served a three plus year spell on the old WIA VK6 Divisional Council and now serve as Chairman of the VK6 Advisory Committee.

## All about the West

Formalities out of the way and down to business.

The lack of VK6 Notes in AR magazine has often been commented by many people here in the West but there has been a distinct lack of hands raised for the job. I am not a scholar or a prolific writer but I have decided to give it a go and see if I can produce an offering every month.

It will all depend on input from the various Clubs and Groups in WA so please send all your news and proposed activities to me at vk6xh@wia.org.au and we will try and get this ball rolling. I will be honest though, if no feedback is received, I am not willing to flog a dead horse!

## NCRG Hamfest

I will start off with a plug for the NCRG Annual Hamfest.

This year it will be held on Sunday 3 August at the usual venue, the Cyril Jackson Recreation centre in Fisher St., Ashfield. Doors will open for traders at 7:30 am and to the public at 9:00 am.

There is no charge for tables for any trader or group; however, everyone must pay the $5 admission fee, even NCRG members. If you require tables or further information please visit the NCRG website at www.ncrg.org.au and fill out the form in the Hamfest section.

This year the featured attraction is the Gravity Centre from Gingin with an interesting display of all things astronomical and a couple of the traders will also have telescopes on view.

The attendance is normally in the 300-450 persons range so it will be a worthwhile visit if you are selling or buying. Doors close at 1:30 pm and raffle prizes will be drawn around 1 pm.

## HARG

I am also pleased to announce the re-birth, so to speak, of the Hills Amateur Radio Group (HARG).

Due mainly to the ageing amateur population in the Hills area, the membership and activities had dwindled to the point where consideration was given to winding it up. Then along came new blood and it is now thriving again. The efforts of Richard VK6BMW, Mick VK6YXL, John VK6NOW and many others have seen a hive of activity at the Saturday afternoon meetings. New radio and antenna projects are underway and hopefully the club will attract many new members (in excess of 30 at present I believe).

I have received a potted history of the first ten years of the group, and forwarded to the Editor of AR for consideration to publish as an article of interest, in a future edition. Stay tuned!

I wish them the best of luck for the future, and keep it informal folks, have some fun!

## NCRG Activities

The Northern Corridor Radio Group meeting in April saw the members receive an excellent presentation by John Warburton G4IRN, a member of the 3X5A contest winning Voodoo Contest group.

John gave a slide presentation of the logistics involved in annually taking part in the CQ World Wide CW contest from locations in West Africa, no mean feat! He also left a DVD of their exploits for members to enjoy and had a play in the club shack, thanks John.

Sunday 27 April was the annual VHF Group Contest and also the Wireless Hill BBQ, so here is a report from Terry VK6ZLT on the activities:

Every year in April the West Australian VHF Group holds its annual field day. This year was decision making time for me with respect to the actual site I was going to use. Like a lot of good field day sites positioned out on bush promontories, in time they become "tree'd out" thus making them unsuitable as point generating sites for radio field days.

Having made some preliminary excursions in the weeks prior to the day I reluctantly decided on a beach site about 100 km south of Perth. Then, the weather decided to take a hand, with the forecast for 'rain and probable thunderstorms' predicted. It was with some trepidation that one thought of setting up in an exposed beach and having all that lovely antenna array hoisted in the air just waiting for the next lightning strike. But rescue was at hand - Phil VK6ZKO, a regular field day participant, had to cancel his field day trip at the last moment, so he offered his site to me.

The site (Mount Dale) is a real ripper, situated behind the Darling Escarpment south-east of Perth. On the day when I arrived at this site it was bucketing down, but it eventually eased to allow me to assemble my beam antennas (12 element 70 cm, 6 element 2 m, 3 element 6 m) on a 5 m steel tubing mast which I attached to a guard rail of the lookout. Fortunately I had a sufficient amount (just) of cable to run back to the car to my IC-706; with an antenna switch for the 70 cm/2 m beams. (I never did get that diplexor up and running in time).

Just a note; I had constructed a new 6 m folding antenna of the 3 element asymmetrical design, which worked superbly. Try one, you will be surprised.

With over 40 contacts to show for the day's effort the outcome was very satisfying.

Graeme VK6BSL made a display of amateur radio related topics that spent quite some time going around the

## News from

libraries of the state and is hoping, after some refurbishment, to send it on its travels again. He is looking for assistance from amateurs in country regions and even interstate to move it from place to place. Please contact me if you can assist and I will pass your details on to Graeme.

The Worked All WA Shires award is ticking over nicely on the low bands and Alek VK6APK is hoping to get some activity moving on 80 m during the winter months, so if you like chasing awards, be on the lookout for the coming activity. More info on the WA Shires award can be found on the NCRG website previously mentioned.

### *From Nigel VK6KHD came the following report:*

*Wally VK6YS and I have an ongoing ambition to work all the IOTAs in VK6. We have set up a website to record the efforts but it is very much a 'work in progress'. See www.westozdx.net. Activity ebbs and flows with available time; we both work in the oil and gas industry and do a lot of travel which often restricts home time let alone expeditions to far flung islands.*

*We activated Cheyne Island last year – see http://www.westozdxnet/IOTAS/OC193/OC193.html and Rottnest – see http://www.westozdx.net/IOTAS/OC164/OC164.html – with Bruce KD6WW making the trip from the US to be part of the exercise. We have also activated Breaksea Island off Albany and Dirk Hartog off Denham, in the past. These are recorded on the website. Still to be added to the website are some interesting tales about activations of islands off the Kimberly coast involving shipwrecks and rescues by the RAN.*

*We also activated the twin lighthouses of Cape Leeuwin and Cape Naturaliste last year during the lighthouse weekend and plan to do the same again in August this year. Lack of propagation has curtailed activities in the last few years but hopefully as the sunspots increase DX will improve. Then again probably no amount of sunspots will improve the eastern states ability to listen and actually work VK6. It is a sad fact that during events such as the RD contest and Lighthouse Weekend we often hear the eastern states 5x9 working someone over the fence in the next state completely ignoring the chance of a trans Australia contact; if only they would listen a bit more.....*

Feel free to use any of the material from the website (with an acknowledgement).

I would appreciate those of you around the state who have news you wish to see in AR contacting me, either individuals or clubs, particularly in the Geraldton, Albany, Bunbury areas, and the north west, as there are many travellers on our roads during the winter months who would appreciate the chance to drop in on a club meeting and say hello.

The local D-STAR project is well on the way toward becoming operational with the location at Wollaston proving a more than satisfactory site to cover the metropolitan area. I have been promised a report from Will VK6UU so more information soon.

Well that's it for this time. Hopefully the information will keep coming in and I can produce this somewhat informal update monthly.

# 2008 WIA Grants scheme launched

**Geoff Atkinson VK3AFA**
**Secretary, WIA**

**Monday 28th July is the closing date for applications for the WIA Club Grants Scheme for 2008.**

Full details and rules are on the WIA website, with a template suggesting application headings for the executive summary, guides to identifying how the club seeks to meet the scheme's objectives and guidance on supporting documentation.

WIA President Michael Owen said that the Board was pleased with the results of the 2007 scheme and believed that there was overall support from members for a continuation of the grant scheme. In 2007, some nine project proposals were received and six received financial support. The Board has changed the rules from those that applied last year, with half of the allocated funds for "useful" and half for "innovative projects.

There is $6,000 for distribution to qualifying Affiliated Clubs. The object of the scheme is to promote and advance amateur radio, the WIA and its Affiliated Clubs by supporting useful and/or innovative projects undertaken or to be undertaken by Affiliated Clubs. Affiliated Clubs with at least 50% WIA members qualify to participate, though the Board has discretion to allow a lesser percentage in special circumstances.

The 2008 Grant Committee will recommend to the Board the projects that should be supported and the amount to be allocated to each supported project. Michael said; *I urge affiliated clubs to participate in this opportunity. However, it is most important that clubs read the rules very carefully*".

**2008 Club Grant Scheme**

***Innovative ideas sought***

**Applications close**

**28 July 2008**

**The rules and application form can be downloaded from**

**http://www.wia.org.au/members/affiliation/about/**

# DX – News & Views

Ernie Walls VK3FM

*(Editor's Note: Our regular columnist John Bazley VK4OQ was on 'leave' for the July column. He did leave notes for our guest columnist, and these form part of this month's DX news).*

Although we are, arguably, almost half a year into Cycle 24, the numbers remain terrible, and very near those of the (presumed) trough of Cycle 23, thus regular DX is difficult to find, particularly from down-under. However, it is there, particularly when DXpeditions make their presence known, or one of the more major contests is in swing, so a keen ear, lots of patience, and a bit of luck are all required to keep the log moving.

Among DX news of the moment is the following:

**VP9:** Ralph K9ZO says to 'look for K9ZO/VP9 during the IARU contest in July'. He will be vacationing with his XYL, but plans to keep an ear on 6, 12, 17 and 30 metres, and to operate in the IARU contest.

**FK:** Look for Jean-Louis F5NHJ to be operating as FK/F5NHJ from Grande Terre, IOTA OC032 from August 12 to 29. Activity will be mostly CW and the digital modes, on 30 metres. Logs will be uploaded to LOTW, and a log search will be available on http://www.f5nhj.fr/logsearch

**TF:** Emil W3EP plans to operate from nine of Iceland's 23 grids between July 26 and August 6. Signing TF/W3EP, he will have 50 watts and a dipole, operating as time and circumstances permit.

**7O:** Chris Lorek G4HCL operated for a few days from Yemen as 7O/G4HCL in August 2007. Bill Moore NC1L, ARRL DXCC Manager reports 'This is not good for DXCC'.

**TM:** TM5F is the special call for Radio Club EME Phocéen F5KDK, August 15 to 18, as they operate from EU095, Frioul Archipelago. They will be on the HF bands operating SSB, CW, PSK and RTTY. Operators mentioned are F1IKA, F5IVP, F5ODA, F5SDD and F6DHI. The web page is http://tm5f.free.fr/

**JA:** Japan's Ministry of Internal Affairs and Communications (MIC) recently announced the expansion of the Japanese band plan of 75/80 metres, effective April 28, 2008. JA can now operate on the following frequencies:

| | |
|---|---|
| 3500 – 3520 | CW only |
| 3520 – 3525 | CW and Digital |
| 3525 – 3575 | CW and Phone |
| 3599 – 3612 | CW and Phone (New) |
| 3680 – 3687 | CW and Phone (New) |
| 3702 – 3716 | CW and Phone (New) |
| 3745 – 3770 | CW and Phone (3745 – 3747, 3754 – 3770 New) |
| 3791 – 3805 | CW and Phone |

The latest Japanese band plan is available at http://www.jarl.or.jp/English/6_Band_Plan/JAbandplan.pdf

**ZS8:** Petrus ZS6GCM is planning to be QRV as ZS8T from Marion Island as soon as work commitments allow. He has been on the island for some months now, and it was thought he may be operating from early May. However, as the senior officer on the island he has been busy ensuring that his period on duty is settled in, and well organised for the future, before devoting time to amateur radio.

Marion Island is currently one of the 'most wanted' DX entities, thus Petrus can expect to be inundated with calls when he does eventually appear. Go to http://zs8t.net/ for the latest information, and stay tuned!

**VK9X:** Marq CT1BWW (VK9XWW), John EA3GHZ (VK9XHZ), Henry EA5EOR (VK9XOR) and Dina EC5BME (VK9XME) will be active from Christmas Island OC-002 on 8 through 20 July. They plan to operate on 160-6 metres CW, SSB, RTTY, PSK31 and SSTV with three stations. QSL via EA4URE, direct or buro.

**KL:** A keenly anticipated one for IOTA chasers will be the Dxpedition to Chuginadak Island, NA234, a new activation, from 21 through 27 July and including a presence in the IOTA contest. They will operate as KL7DX. Operators are Yuri N3QQ, John KE7V and Yuri UA9OBA. QSL via AC7DX. Further information is at http://www.NA-234.com/

**BY:** Five Beijing Olympic Games special event stations appeared on air around mid May and will be active until 17 September. The five special callsigns each represent a colour of the Olympic flag: BT1OB (for Beibei, blue), BT1OJ (for Jingjing, black), BT1OH (for Huanhuan, red), BT1OY (for Yingying, yellow) and BT1ON (for Nini, green). The QSL manager is BA4EG, direct or bureau.

## DX pile-up operational and behavioural expectations.

One of the enduring topics discussed among DXers is the behaviour exhibited by those calling the DX in the inevitable pile-up.

- Do you acknowledge the DX when he calls for 'only 3s', by not calling unless you have a three in your prefix?
- Do you acknowledge the DX when he calls directionally, that is, for 'NA', or 'EU', or whatever, if you don't reside in the continent being called?
- Do you call even when you know the DX is transmitting?
- Do you call, and call, and call, even though you can barely hear the DX?
- Do you call on the DX frequency, through ignorance or even when you know he is working split?
- Are you one of the ubiquitous 'policemen' always found in pile-ups?
- Do you continue calling, even when the DX is listening to the lucky recipient of the pile-up as he tries to make a good QSO?

Well, all of these things happen, and rather more regularly than one would like to admit, and more so when the DX is 'rare' DX, like Ducie Island, Clipperton, Rwanda and Mauritania were only recently.

I have to admit that I transgress on one of those 'DX commandments' – I will call the DX even when he is calling directionally, provided only that I can

*continued on page 38*

## DX – News & Views

*continued from page 37*

hear him well enough that I truly believe a QSO can be made.

Why would I do this?

Well, firstly let me say that I could wait a very long time, in most pile-ups, for 'OC' to be called. And, if it were, and I blinked, I would quite possibly miss the directional call to 'OC' because, almost certainly, given two minutes, it would be over, and the DX would have moved on to another, more 'active' continent.

It is also my experience that most good DX operators now realise that calling SA, AF, AN and OC is, essentially, only a means of slowing down QSO rates, as the numbers of DXers from these continents is so small as to be inefficient if directional calls were made as regularly, or even regularly, as to other areas.

Again, it is my experience that most good operators will respond to a call from a VK/ZL station, even if calling directionally somewhere else, because it is the most efficient way of handling the traffic from that area – and provides very little disruption to the orderly management of the pile-up. Certainly, in two of the biggest and most looked–for DXpeditions of recent times, Ducie and Clipperton, operators readily responded to VK/ZL calls, got them 'out of the way' then moved on. In addition, I believe that this policy was followed by the KH8SI Swains Island DXpedition, itself one of the largest and most successful DXpeditions of all time.

As an aside, there are probably no more than 200-300 intrepid DX souls in VK/ZL combined, and our contribution to the QSO totals of the four afore-mentioned DXpeditions was approximately 1.0%.

That is why I call whenever I think I have a chance – no operator is going to spend a lot of time on 1.0% of his potential customer base – he is going to work (call) where the numbers are – in all cases NA, then EU then JA. Those three generally account for 90%+ of all QSOs made by a DXpedition.

So, there you go, that is my reason – I do admit following this policy does require a deal of common sense, and caution, but thus far I have escaped admonition from the DXpeditions themselves. I wonder what your view may be on this very lively subject!

ar

## ALARA

**Christine Taylor VK5CTY**

### Keeping a log for the contests

We are fast approaching the busiest Contest season of our year. In the middle of next month, August, it will be the Remembrance Day (RD) Contest, on the 15th and 16th. At the end of the month we have the ALARA Contest over the weekend of 30th and 31st August.

It is important, if you participate in a Contest, to send in your log. But what do we mean by this log we need to keep and send in?

Until about 15 or 20 years ago every amateur kept a list of all his contacts in a book on the desk at home (he kept a log of contacts).

Then we started talking to people as we moved around, from our cars or just walking along, so it was harder to write down every contact. So now it is rare to keep a record of the people you talk to on the radio - except in a Contest!

During a Contest you write down the callsign of the station you are in contact with, the signal report he gives you (remember learning about signal report 5 and 9 for a very good strong signal, or 1 and 2 or 3 for a signal you can hardly hear or understand?). You also exchange numbers with the station, to tell him and anyone listening, how many contacts you have each made since the beginning of the contest.

It is usual to combine the signal report and the number, eg. 59001 for the first contact or 54010 for the 10th one in which you could hear every word but the signal was not very strong.

Most radio clubs have log books or pads of log sheets for sale, or they can be bought from the WIA bookshop (which is now on line!).

You can draw up a set of columns to make your own log sheet:

> date/time/band/other callsign/your sig & number/other sig number/ name of the operator

A typical entry in my log for the ALARA Contest could be:

30Aug/1000/3600MHz/
VK3DMS/59001/54010/Marilyn

In the ALARA Contest it is a good idea to mark beside the name to remind you who is an ALARA member because you get more points for them.

After the Contest finishes, before you forget to do it, I recommend you make a copy of the entries in your log ready to send in to the Contest Manager. Keep the original log for future reference. (Often the original is a bit messy with stations you heard but did not connect to before they disappeared, but that is also a record of the event).

Look in *Amateur Radio* for the address you must send your log to, and the final date (you do not want to miss this or your log will not be counted).

### The RD and the ALARA Contest

The RD Contest, or Remembrance Day Contest is always held on the Saturday and Sunday of the weekend closest to the end of WW2 (August 15th 1945), so this year it will be run from 0900 UTC on Saturday 15 August to 0859 UTC on Sunday 16 August.

In this Contest you may only make a legal contact with each station once on each band, so it is a good idea to set up a method of checking a callsign when you hear it, to make sure you have not talked to them on this band before. If you operate for 24 hours (and lots do) you will hear "Cannot talk to you OM, we had a contact at ...." quite often.

Participation in this Contest is for the glory of your own State (though there is always a list of scores, so you can see how well you did compared to your friends), so be sure to send your logs in to boost the number of participants from your state and the total number of contacts. Both of these figures are taken into consideration when the winning state is being calculated. Even a small score of ten or twelve can count in the final result.

Within ALARA we also use the RD Contest to check that our equipment is running well and is ready for our own ALARA Contest.

The ALARA Contest runs for 36 hours with two evening sessions so that we have two chances to use the 80 metre band.

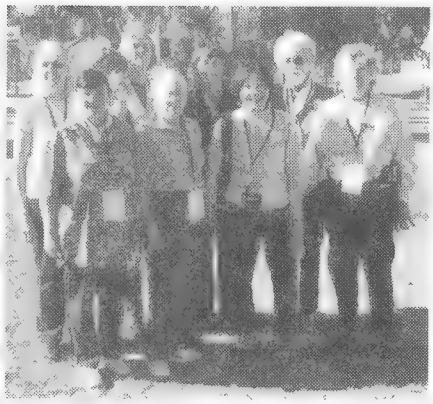
80 metres is the band we use on Monday Nets and was chosen as the band of choice in the days of the Novice licence when Novices were not allowed

to use all bands and all frequencies and we have continued to emphasise this band.

We start the Contest at 0600 UTC on Saturday but continue till 1159 UTC on Sunday. In the ALARA Contest, because there are not many ALARA members we are allowed to have repeat contacts with each other and with other stations an hour apart. We watch the log we are keeping for the correct minute to roll over before we make another contact. You will hear "No we cannot make a contact yet, my log says we have another two minutes".

## ALARA's representation in Broken Hill

ALARA was very well represented at the WIA AGM: our President Marilyn VK3DMS and nine other YLs from all round Australia. We had Dot VK2DB representing New South Wales, Marilyn and Lia VK3LPH from Victoria, six from South Australia Meg VK5YG, Jenny VK5FJAY, Lesley VK5HLS, Jeanne VK5JQ, Susie VK5FSUE and Christine VK5CTY, and after arriving with just ten minutes to spare because the train was held up, Kathi VK6KTS



The ALARA group at the Saturday lunch in Broken Hill

to represent Western Australia. It was a very satisfactory number. We did not plan to all be there, it just happened.

The report of the whole weekend will have been covered elsewhere in this magazine but one of the highlights for me was the visit to the School of the Air where we came to understand just how important this service is to the children. The motto of this school says it all: "Parted but United".

Another talk I enjoyed very much was given by the current pastor of the Inland Mission founded by John Flynn. He spoke at breakfast on the Sunday.

As this talk was followed by a visit to the Royal Flying Doctor Base where we saw the planes that carry the doctors and the pastors all over the area covered by the "umbrella of safety" Rev. John Flynn envisioned. We really gained an insight into this important world.

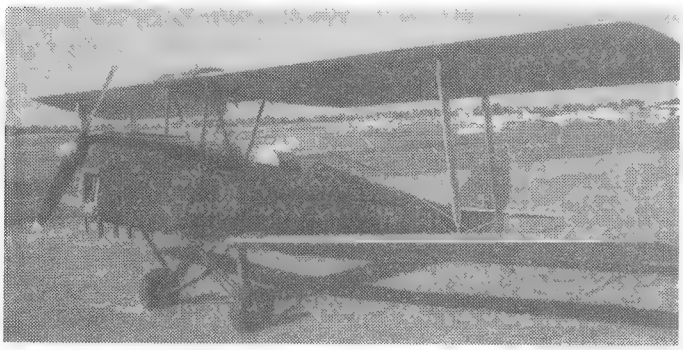
## Luncheons

The monthly luncheons in several states continue. In VK5 we meet on the second Friday of the month. In VK6 they meet on the third Thursday of the month, and in VK3 they meet on the second Saturday.

The recent VK3 luncheon was held at the Moorabbin Airport and included a tour of the airfield. For this occasion a number of OMs joined the ladies, which in VK5 only happens for the Birthday Lunch.

In July we have special Birthday Lunches as close as possible to the end of July, when ALARA was formed 33 years ago. We also try to go on air on the Saturday evening of that weekend to wish each other "Happy Birthday". Same time and frequency as the Monday nets. Let us hope we have a good number of us this year. It is fun to remember the beginning of ALARA.

BT



The "Red Baron" - a bright red biplane admired at Moorabbin Airport

The VK3 luncheon group at Moorabbin Airport

## Information sought

I am currently researching my family tree and was wondering if you would put this little letter in the next Amateur Radio magazine?

I have discovered that my mother Gloria Ling went to radio school in Melbourne. This would of been in the 1940s. I was reading about the Marconi School of Wireless reunion back in the 90s and wondered if there was anyway I can get a certificate for my mother.

She called it a Radio Operators Licence and when she finished the course was the first woman in Victoria and second in Australia to do so. She then went on to work for the ABC in Melbourne for 3 and a half years, Radio Australia for one year and then 2UW in Sydney for 4 years as a control operator.

She then moved to Tasmania to 7QT and 7LA announcing and copywriting. I know this is a long shot but would love to hear from anyone who may be able to help me locate that little certificate.

I can be contacted by e-mail or mobile phone:

**Isabelle Answerth**
ianswerth@hotmail.com
0450 046 592

# Contests

Phil Smeaton VK4BAA

## *Welcome to this month's Contest Column.*

After last month's news that Team VK had given the rest of the world a resounding thrashing by winning the Commonwealth Contest, comes a bevy of contest results featuring VK stations at the top of the results table:

## All-Asia SSB Contest 2007 Results

| Callsign | Band | Score | Op. Name |
|---|---|---|---|
| VK4HAM | All | 23,920 | Andy |
| VK4FRAJ | All | 600 | Raj |
| VK3ZGP | All | 49 | Len |
| VK1ANU | 20 | 30 | Masanori |

Congratulations to all participants listed, but especially Andy VK4HAM and Raj VK4FRAJ for a sterling effort. Masanori VK1ANU was in Canberra until the end of May this year and his home call of JO2SLZ (his language skills, that is) no doubt helped him land a few that others might not have logged.

This contest runs at the same time as the Region 1 Phone contest and can, at times, clash a little bit from the Eu perspective. There tends to be plenty of multipliers around the bands for the European stations to try and get into the log, often to be rebuffed by All-Asia competitors as they gain no points by working non-Asian stations. Europeans have a different scoring system and tend to concentrate on working /P (portable) stations to gain maximum points per QSO. The exchange differs as well, with serial numbers being replaced by the age of the operator for All-Asia participants – except for female operators who are permitted to send "00" if they do not want their age to be known.

## LZ DX Contest 2007 Results

| Callsign | Score | Op. Name |
|---|---|---|
| VK4TT | 5740 | Keith |
| VK8AV | 816 | Alan |
| VK7GN | 300 | Martin |

Photo 1: 10 m beam used at VK8AA. Photo: David Burger VK2CZ.

This multimode (CW & SSB) contest is organised by Bulgarian Federation of Radio Amateurs and takes place on the weekend before the last full weekend of November. The scoring system consists of 10 points for each QSO with an LZ station, 3 points for each QSO with another continent and 1 point for each QSO with the same continent. The multiplier is then the sum of ITU zones and LZ districts (there are 28 of them) on each band regardless of the mode. Hence, in order to maximise the multiplier count, Bulgaria needs to be heavily targeted to log those 28 LZ districts. This is no mean feat when you consider they are all on the other side of the planet and the sunspots are thin on the ground.

## 2007 10 m ARRL Contest

Tables list callsign (VKs only), score, class (A = Mixed Mode, B = Phone only, C = CW only, D = Multi-Op), and power (A = QRP, B = Low Power, C = High Power).

| Callsign | Class | Score | Op. Name |
|---|---|---|---|
| VK4FRAJ | AA | 9,576 | Raj |
| VK5MAV | AA | 944 | Andy |
| VK2GWK | AC | 4,676 | Henk |
| VK7GN | AC | 2,376 | Martin |
| VK4ATH | BA | 312 | Tom |
| VK7WPX | BB | 152 | N/A |
| VK8AA (Op: VK2CZ) | BC | 13,770 | David |
| VK4ZD | BC | 2,808 | Bill |
| VK3AVV | BC | 256 | Mike |
| VK4TT | CB | 2,800 | Keith |
| VK2AYD | CC | 3,696 | David |
| VK2NU | CC | 624 | David |

David Burger VK2CZ participated in the contest as VK8AA. David evidently spent quite some time planning the event – see photo 1.

The monster nine (9) element Yagi antenna was 23.5 m (77') long and boom size is 80 mm in the middle and 60 mm at the ends. It weighed in at around 115 kg and obviously required a bit of assistance to get it into the air. With a gain of 14.1 dBi, David could generally be heard wherever he pointed the beam – if propagation permitted! The whole lot was supported about

## Contest Calendar for July 2008 – August 2008

| | | | |
|---|---|---|---|
| **July** | 1 | Canada Day Contest | CW/SSB |
| | **6** | **VK/trans-Tasman 160 metres Phone Contest** | **SSB** |
| | 12/13 | IARU HF Championship | CW |
| | **14** | **Jack Files Memorial Contest** | **CW/SSB** |
| | 19/20 | CQWW VHF Contest | All modes |
| | **20** | **VK/trans-Tasman 160 metres CW Contest** | **CW** |
| | 26 | Waitakere (NZART) Sprint | SSB |
| | 26/27 | RSGB IOTA Contest | CW/SSB |
| **August** | 2 | TARA Grid Dip | PSK/RTTY |
| | 2 | Waitakere (NZART) Sprint | CW |
| | 2/3 | 10-10 International QSO Party | SSB |
| | 9/10 | Worked All Europe | CW |
| | **16/17** | **Remembrance Day Contest** | **CW/SSB/FM** |
| | 16/17 | Keymen's Club of Japan Contest | CW |
| | **30/31** | **ALARA Contest** | **CW/SSB** |
| **September** | **6** | **ARDF Championship (80 m)** | **CW** |
| | 6/7 | All Asia Contest | SSB |
| | 6/7 | RSGB SSB Field Day | SSB |
| | 6/7 | Region 1 Field Day | SSB |
| | 13/14 | Worked All Europe | SSB |
| | 20/21 | SRT (Italian) HF Contest | SSB |
| | 27/28 | CQWW RTTY DX Contest | RTTY |

20 m in the air by a 14 tonne crane at the Darwin East Arm Port Facility. At this stage of the sun spot cycle, this is a very tough contest to engage. David managed to grab 259 QSOs for the log, but "could not operate after dark due to site safety, lack of lighting and blood sucking bugs the size of a shoe". David is rightfully pleased with managing number 1 Phone in Oceania for the 5th consecutive year (probably a record in itself?), placed number 8 in the world for Phone and number 5 in the world in the BC Category. I cannot help but wonder how David is going to approach the 2008 contest....

## CQWW WPX CW 2008 Claimed Scores

At the time of writing, the following stations had submitted a score for the contest:

| Callsign | Operator | Claimed Score | Transmitter | Band | Power | Assisted |
|---|---|---|---|---|---|---|
| VK3FM | Single | | One | All | High | Assisted |
| VK3KE | Single | 36708 | One | All | Low | Assisted |
| VK3TDX | Single | 19630 | One | All | Low | Non- Assisted |
| VK4BAA | Single | 232 | One | 80 m | Low | Non- Assisted |
| VK4BUI | Single | 254474 | One | 20 m | Low | Non- Assisted |
| VK4TT | Single | 129132 | One | All | Low | Non- Assisted |
| VK5SW | Single | | One | All | Low | Non- Assisted |
| VK6DXI | Single | 1679900 | One | All | High | Non- Assisted |
| VK8AV | Single | 44144 | One | 40 m | Low | Non- Assisted |

I managed to have a brief stint on 80 m during the contest to try-out a new 80 m antenna. I used the same antenna during the recent John Moyle Memorial Field Day Contest and it seemed to work reasonably well, so I was interested to see how it performed as regards DX. I need not have bothered. It was not very impressive as I struggled to make myself heard. I could hear NA stations during the early grey line period and commenced calling them – but to no avail. Over the next 30 minutes or so, their signals got stronger and stronger, until many were a genuine 599 report – but they still could not hear me. I even had a short burst at the VL/ZL Trans-Tasman contest but my PC decided to call it a day and proceeded to shutdown or lock-up at erratic intervals. I took the hint and gave up after trying to work stations on the straight key. The PC was still connected to the rig and keyed the rig into transmit but refused to de-key. That was the time that I decided to switch off the station and have a visit by Mr. Boag.

Conditions did not seem to be particularly impressive in VK4 – 80 m in particular! Multipliers count for all bands and are not band specific, so 80m was always going to be a hard slog, but I needed to trial the antenna so that was my band of choice on this occasion. There is no incentive to search the bands looking for multipliers as such, so the higher bands took most of the traffic during the contest. 40 m particularly seemed lively in comparison. The lower bands give a double amount of QSO points though, when compared to 20-10 m, so 40 m is an obvious choice in VK to hunt for points and multipliers for WPX. As usual, the EU noise is difficult to penetrate, but participation seemed to me to be low this year and CQ calls often went unanswered. There have been reports of 15 m opening into JA but with few takers at the other end.

## OCDX Contest Results 2007

Brian Miller ZL1AZE on behalf of the OCDX Contest Committee has notified the Lockyer Valley Radio and Electronics Club that VK4WIL achieved the highest score from OC for the M/M Phone category in the 2007 Oceania DX Contest. The station consisted of the following operators: Laurie VK4VCC, Trent VK4TI, Dave VK4NDX, Phil VK4BAA, Di VK4KYL, Bill VK4ZD and Alan VK4SN. Additional help was received from VK4HAM during station set-up. This is an excellent achievement and is a credit to Bill and Di for kindly making their new (and at the time, incomplete) premises available to the team for the contest. The team were generally unknown to each other and the equipment had not been gathered together before either, but the team quickly set about gelling together to fill the log as fast and as accurately as possible. Some antenna hardware was already on site, but the vast majority was erected (or even constructed) specifically for the contest. Alan VK4SN spent a not inconsiderable amount of time climbing trees and strapping lengths of rope up in the air to lodge wires for the various bands of interest. Alan had also just completed the electrical wiring and data communication set-up for the shack only a day or so prior to the contest – nice going Alan!

If you have any contest related material for inclusion within the column, topics that you would like covered or even some experiences and pictures you would like to share, then please feel free to get in touch via vk4baa@wia.org.au. See you on the bands.

**73 de VK4BAA Phil Smeaton.**

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*Plan ahead*

***30 & 31 August***

**ALARA Contest**

# Spotlight on SWLing

**Robin L Harwood VK7RH**

# A pleasant surprise and other chaotic events

**I was amazed to discover that I had won the Higginbotham Award when I was reviewing the WIA News on a cold Sunday afternoon. It certainly is an honour to win this prestigious award and I wish to publicly thank the Publications Committee for nominating me.**

When I started out compiling this column in 1980, there was so much activity and there was not a spare piece of spectrum space. Every Hertz was occupied and there was always something to be heard. Almost three decades on and today's activity on HF has reduced. International broadcasters are departing shortwave in droves, preferring to either stream audio on the Internet or abandon broadcasting entirely. The latest to do so is Radio Singapore International. I believe that they will be turning off the Kranji senders at the end of this month and you just have a few days to hear them before their signals fade away in the ether. They are on 6080 in English from 1100 to 1400 and on a few other 49 metre channels in either Malay, Chinese or Hindi. The reason cited for this cessation was that there was a big drop in audience numbers, so the decision was made to concentrate on streaming Radio Singapore domestic networks and wind up the International Service. The Kranji senders were originally installed for the BBC World Service and it is unclear if the Singapore decision will effect any alterations to their schedule. They have already reduced their output in the local daylight hours.

VT Thomson manages a variety of senders worldwide and some were former BBC external service bases. They have quite a number of clients utilising their facilities, including Kranji. Broadcasters such as Radio Japan, Deutsche Welle, Radio Australia, FEBA as well as the BBC World Service have all been known to use Kranji in recent years.

In early May, two natural disasters hit Asia and there was a huge loss of life from both calamities. Myanmar, or Burma as it is more commonly called, was hit by a cyclone. The response was very poor and uncoordinated. This cyclone was mostly ignored by the local radio and again shortwave radio filled in the intentional void left by the Burmese junta. Millions of people are still without help or aid as the junta has refused all offers of assistance. The world community understandably was shocked at this callous behaviour.

A few days later, a massive earthquake hit the Szechuan Province of China and again there were thousands of people killed, many of them children. The response was swift and immediate. Unlike the Burmese, the Chinese were openly candid and the networks covered the news extensively. As the magnitude clearly became apparent, the major network began to relay the Szechuan Provincial Station and a common program was aired during the three days of Official Mourning. Elsewhere you may read of the amateur radio response to aid the rescue effort. Even the jammers were silent or ended up relaying the common program.

Next month sees the Olympic Games commence in Beijing and we expect this to be extensively covered by the proliferation of Chinese shortwave senders. Yet the streaming of audio of Olympic events via the Net will again not happen as the IOC jealously guards their exclusive rights and very few if any broadcasters will bother to stream sport in case they breach this IOC copyright.

Well that is all for now, if you have any news or comments please send them to vk7rh@wia.org.au or to 20/177 Penquite Road, Norwood Tas 7250

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Bill Magnussen VK3JT

## Six-monthly review of Ups and Downs

As in previous instances, this review will deal only with amateur radio satellites that are currently fully or mostly operational in our part of the world – and then with some caveats. There will be times when a particular satellite may not appear due to some usually short term problem. For more up to date information refer to the appropriate internet website. It is quite impossible to keep a list like this absolutely accurate, even at the time of publication.

The Cube-Sats and/or educational satellite packages are listed but their status can change with no notice at all. Some could have re-entered by the time you read this column. The Cube-Sats, tiny 10 cm cube packages are mostly designed and built by University or College students. Their missions focus on data collection in some specific area of science. They are generally short-lived and the presence of their telemetry beacons in the amateur bands is in the hope that the world-wide amateur radio satellite community will provide feedback to the students in the form of telemetry collection or advice in setting up radio ground control links. In turn they provide the amateur community with practice in tracking and telemetry gathering techniques that will be valuable, particularly to newcomers who may wish to broaden their horizons and to those wishing to evaluate their ground station performance. As well there is the very great possibility that those College or Uni students exposed to amateur radio perhaps for the first time by their involvement may be imbued with the esprit de corps and become radio amateurs.

In many cases the controllers communicate regularly with AMSAT via the bulletin board and as a consequence they get regular feedback from the amateur radio satellite community around the globe. To save space only those satellites that are listed by reliable sources as operational in the southern hemisphere will be included in the list. The current situation is best followed on the AMSAT-NA bulletin board but neither it nor the AMSAT-NA web site can hope to remain totally abreast of day to day happenings. You will notice that a number of the Cubesats have their status listed as 'in-orbit'. Presumably that means the control stations have confirmed they are operational and transmitting telemetry on demand. No individual web sites are listed here for these satellites but the AMSAT web-site may have more information. The list is in order of Oscar number where possible.

## AO-7 AMSAT OSCAR 7

Launch Date: November 15, 1974. This is not a typo, say again, 1974. That is 34 years and still counting!

Status: Operational depending on the amount of sunlight

Current Mode: Listen before transmitting

Uplink: 145.850 to 145.950 MHz CW/USB Mode A

432.125 to 432.175 MHz CW/LSB Mode B

Downlink: 29.400 to 29.500 MHz CW/USB Mode A (1W PEP)

145.975 to 145.925 MHz CW/USB Mode B (8W PEP)

145.975 to 145.925 MHz CW/USB Mode C (2W PEP)

Beacon: 29.502 MHz CW

http://www.amsat.org/amsat-new/satellites/sat_summary/ao7.php

## The AMSAT group in Australia.

National Co-ordinator: Paul Paradigm VK2TXT
Secretary: Judy Williams VK2TJU
Website: www.amsat-vk.org
E-mail for National Coordinator: coordinator@amsat-vk.org
E-mail for Secretary: secretary@amsat-vk.org

### The AMSAT monthly nets

*Australian National Satellite net*

The net takes place on the 2nd Tuesday of each month at 8.30 pm eastern time, i.e. 9.30 Z or 10.30 Z depending on daylight saving. The AMSAT-VK net has been running for many years with the aim of allowing amateur radio operators who are operating or have an interest in working in the satellite mode, to make contact with others in order to share their experiences and to catch up on pertinent news. The format also facilitates other aspects like making 'skeds' and for a general 'off-bird' chat. In addition to the EchoLink conference, the net will also be available via RF on the following repeaters and links.

*In New South Wales*

VK2RMP Maddens Plains repeater on 146.850 MHz
VK2RIS Saddleback repeater on 146.975 MHz
VK2RBT Mt Boyne Repeater on 146.675 MHz

*In Victoria*

VK3JED Preston, Melbourne on 144.296 MHz SSB simplex
VK3JED Preston, Melbourne on 439.175 MHz FM simplex with a 91.5 Hz CTCSS tone
VK3RTL Laverton, Melbourne, 438.600 MHz FM, -5 MHz offset

Operators may join the net via the above repeaters or by connecting to EchoLink and either the AMSAT-NA or VK3JED conferences. The net is also available via IRLP reflector number 9509. We are keen to have the net carried by other EchoLink or IRLP enabled repeaters and links in order to improve coverage. If you are interested in carrying our net on your system, please contact Paul via email.

*AMSAT-Australia HF net.*

Members and interested parties are also reminded of our HF net which is held on the 2nd Sunday of each month. See www.amsat-vk.org or www.ozsatgroup.info for details. Amateur satellite operating is one of the most interesting and rewarding modes in our hobby. The birds are relatively easy to access and require very little hardware investment to get started. You can gain access to the FM 'repeaters in the sky' with just a dual band handheld operating on 2 m and 70 cm. These easy-to-use and popular FM satellites will give hams national communications and handheld access into New Zealand at various times through the day and night. The organisers wish to thank the Illawarra Amateur Radio Society for carrying our net on the Coastlink repeater network and Tony VK3JED for the use of his linking system. Should you wish to join AMSAT-Australia, details are available on the web site. You will be made very welcome.

## AO-16 PACSAT

Status: Semi-operational
Current Mode: V/U
Digipeater - Authorized for APRS usage
Uplink: 145.900 MHz FM 1200-baud Manchester FSK
145.920 MHz FM 1200-baud Manchester FSK
145.940 MHz FM 1200-baud Manchester FSK
145.960 MHz FM 1200-baud Manchester FSK
Downlink: 437.026 MHz SSB 1200-baud PSK
Mode-S Beacon: 2401.1428 MHz
Broadcast Callsign: PACSAT-11
BBS: PACSAT-12
http://www.amsat.org/amsat/sats/n7hpr/ao16.html

## GO-32 Gurwin TechSat-1B

Status: Operational but difficulties are reported occasionally.
Current Mode: V/U
Downlink: 435.225 MHz FM (9600-baud FSK)
Uplinks: 145.850 FM, 145.890 FM, 145.930 FM, 1269.700 FM, 1269.800 FM, 1269.900 FM
Broadcast Callsign: 4XTECH-11
BBS Callsign: 4XTECH-12
http://www.iarc.org/techsat/techsat.html

## NO-44 PCSAT

Status: Operational only in full sunlight
Current Mode: V
General Usage Uplink/Downlink: 145.827 MHz 1200 Baud
Special Usage Downlink: 144.390 MHz 1200 Baud
http://pcsat.aprs.org

## SO-50 SAUDISAT-1C

Status: Operational.
Current Mode: V/U
Uplink: 145.850 MHz FM - 67.0 Hz PL tone
Downlink: 436.795 MHz
Mode and Antenna Polarization:
V: Linear
U: Linear

To switch the transmitter on, you need to send a CTCSS tone of 74.4 Hz.

The order of operation is thus: (allow for Doppler as necessary):

1) Transmit on 145.850 MHz with a tone of 74.4 Hz to arm the 10 minute timer on board the spacecraft.
2) Now transmit on 145.850 MHz (FM Voice) using 67.0 Hz to PT the repeater on and off within the 10 Minute window.
3) Sending the 74.4 Hz tone again within the 10 minute window will reset the 10 minute timer. Users have reported difficulties recently.

## AO-51 ECHO

Status: Voice Repeater
Current Mode(s): FM Repeater - V/U
Analog voice downlink: 435.300 MHz FM, 435.150 MHz FM, 2401.200 MHz FM
Analog voice uplink: 145.880 MHz FM, 145.880 MHz USB, 145.920 MHz FM,
1268.700 MHz FM - 67Hz PL tone
Digital Downlinks: 435.150 MHz FM 38k4 Digital, PBP, 435.150 MHz FM 9k6 Digital, Pacsat Broadcast Protocol
2401.200 MHz FM 38k4 bps, AX.25
Digital Uplink: 145.860 MHz FM 9k6 Digital, Pacsat Broadcast Protocol
1268.700 MHz FM 9k6 PBP Digital
Beacon: 435.150 MHz
Mode and Antenna Polarization:
T: Linear
V: Linear
U: TX A (usually digital)LHCP
TX B (usually analog) RHCP
L: Linear
S: Linear
Broadcast: PECHO-11
BBS: PECHO-12
http://www.amsat.org/amsat-new/echo/

## VO-52 HAMSAT

Status: Operational
Current Mode: U/V - Indian Transponder
Indian Transponder:
Uplink: 435.220 to 435.280 MHz LSB/CW
Downlink: 145.870 to 145.930 MHz USB/CW
Dutch Transponder:
Uplink: 435.225 to 435.275 MHz LSB/CW
Downlink: 145.875 to 145.925 MHz USB/CW
Indian Beacon: 145.859330 MHz CW
Dutch Beacon: 145.860 MHz 12 wpm with CW message
Mode and Antenna Polarization:
V: LHCP
U: RHCP
http://www.amsat.in/hamsat.htm

# CUBESATS

Like the mail, the Cubesat projects just keep coming. They come and go so fast that you need to be in constant touch with a reliable internet source to keep up. They are usually launched in batches of a half-dozen or so from a single launch. Because of this it is always a few weeks before they separate sufficiently and accurate tracking data is available. The monitoring of the telemetry from the Cubesats is becoming a specialised operation requiring close attention to the most reliable and immediate sources. The following information has been gleaned from the AMSAT-NA bulletin board and various other AMSAT sources. Check the very latest information regarding the Cubesats before planning your monitoring sessions.

## CO-57 CubeSat

Status: Operational
Beacon: 436.8475 MHz CW
Telemetry: 437.4900 MHz AFSK 1200 bps
Callsign: JQ1YGW
http://www.space.t.u-tokyo.ac.jp/cubesat/mission/V/

## CO-58 CubeSat

Status: Operational - CW Beacon only 437.4250 MHz AFSK 1200 bps
Callsign: JQ1YGW
http://www.space.t.u-tokyo.ac.jp/cubesat/mission/V/

## DO-64, Delfi-C3

### classified as a nano-satellite

Status: Semi-Operational
TLM beacon 145.870 MHz
Transponder 435.53 – 435.57 MHz up. 145.88 – 145.93 MHz down.
The transponder is not active but the telemetry has been heard in VK.

## CUTE1.7+APDII CubeSat

Status: IN ORBIT
Downlink: 437.475 MHz 9k6 Packet
Telemetry heard in VK

## COMPASS-1 CubeSat

Status: IN ORBIT
Downlink: 437.275 MHz CW 437.405 MHz Packet
Telemetry heard in VK

## SEEDS CubeSat

Status: IN ORBIT
Downlink: 437.485 MHz
Telemetry has been heard in VK

## INTERNATIONAL SPACE STATION – the ARISS project

Catalog number: 25544
Launch date: November 20, 1998
Status: Operational
Current Mode: Occasional Voice/ packet Digipeater
Expedition 15 crew:
Commander: Fyodor Yurchikhin RN3FI
Flight Engineer: Sunita Williams KD5PLB
Flight Engineer: Oleg Kotov
Digital/APRS:
Worldwide packet uplink: 145.990 MHz FM
Worldwide packet downlink: 145.800 MHz FM
Voice:
Region 1 voice uplink: 145.200 MHz FM
Region 2/3 voice uplink: 144.490 MHz FM
Worldwide downlink: 145.800 MHz FM
SSTV TESTING: watch for updates on the BB.
Worldwide Reported Downlink: 145.800 MHz FM
Crossband Repeater:
Repeater Uplink: 437.800 MHz FM
Repeater Downlink: 145.800 MHz FM
Mode and Antenna Polarization:
V: Linear
U: Linear
Callsigns:
German: DP0ISS
Russian: RS0ISS, RZ3DZR
USA: NA1SS
Packet Mailbox: RS0ISS-11
Packet Keyboard: RS0ISS-3
Digipeater callsign: ARISS
Official ARISS Webpage: http://www.rac.ca/ariss
ISS Daily Crew Schedule: http://spaceflight.nasa.gov/station/timelines/

## Recently

As this column goes to print a new Russian satellite is being tracked by the AMSAT community. Dubbed YUBILIENY, it is transmitting on 435.315 MHz +/- Doppler. The transmission seems reminiscent of the old Russian WEFAX format used by their weather satellites of a few years ago. Occasionally it transmits CW and steady carrier. So far no-one has reported decoding any pictures. By the time you read this, reliable Keplerian elements should be available. Moves are being made to contact members of AMSAT-R to see if they have any further information regarding the possibility of a transponder being on board.

## Future goodies.

### *Phase 5a - Marburg University's Mars Mission*

This is not an amateur radio satellite in the same sense as any so far. First mooted in 1996, it will be the culmination of over a decade of activity at Marburg University. With the close involvement of AMSAT-DL, it will probably contain an amateur radio beacon designed to test the resolve of even the most advanced amateur station operators. A precedent was set in early December 1996 when a 70 cm beacon on board the Mars Global Surveyor was detected by amateurs when the spacecraft was three weeks into its trip to Mars and five million kilometres from Earth. Technology used by radio amateurs has improved since then but P5a will still be a mighty test for any amateur station.

Proposed Launch Date: 2009 or 2011 depending on systems testing and favourable Mars aspect.
Status: Design Phase
http://ticket-to-mars.org

## PHASE 3e - advanced High Orbiter

Proposed Launch Date: Was originally listed as late 2007, which is obviously a bit ambitious. This project will go ahead, if a little late, as it is in a way a test platform for some systems to be flown on P5a. A 2009 launch date for P3e could be announced soon which would probably push the P5a launch out to the 2011 opportunity.
Status: Under Construction
http://www.amsat-dl.org/p3e/

## AMSAT-Eagle - advanced High orbiter

Proposed Launch Date: Early/Mid 2009, which is probably rather optimistic.
Status: Although the proposed launch date is listed as 2009, Eagle is still very much in the design stage. No launch has been negotiated at present. Funding is also behind schedule.
http://www.amsat.org


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**In either case a $5.00 joining fee applies. The annual fee is $8.00 or only $15.00 for two years. The Club journal, OTN, is published twice each year and there are monthly news broadcasts. We also guarantee good fellowship.**

Write to
RAOTC,
PO Box 107,
Mentone, VIC., 3194
or call Derek VK3XY on 03 9563 6909
or Bill VK3BR on 03 9584 9512.

**More details of the Club and membership application forms are available from our web site:**
**http//:www.raotc.org.au .**

# VHF/UHF – an expanding world

**David Smith VK3HZ**
vk3hz@wia.org.au

## Weak Signal

**David Smith VK3HZ**

I have received a number of interesting submissions from people detailing their activities. So, this month the majority of the column will be turned over to them.

Barry VK3BJM near Kyneton in central Victoria reports on some enhancement to the west on Saturday 10th May:

*On firing up the station at 2200 Z on Saturday morning, I noted the Adelaide 2 m beacon at 419 and reasonably steady. I spent the next hour working the usual suspects to the NE, then at the top of the hour I heard Phil VK5AKK on 144.200 MHz through the back of the array. I redirected myself to the Adelaide direction and worked Phil at 55. We QSYed down to 144.160 MHz, and were followed by Geoff VK5GF. I worked Geoff, who was a smackingly comfortable 58. 70 cm was not playing ball though, and no contacts were completed there. Phil and I both tried 23 cm as well, but again were unsuccessful. The VK5VF 2 m beacon was about 53 at the time.*

*I continued to call to the west, and at 2313 worked Gary VK5ZK, who was 55 on 144.100 MHz. At 2332 Z, Terry VK3ATS, in Mildura, was worked on 144.150 MHz at 58.*

*Interestingly, stations just north of Adelaide (and slightly over the Mt Lofty Ranges) were not accessing the path - after much effort Brian VK5BC and I completed on 144.100 MHz, with reports of 31 both ways, at 0007 Z. At the time VK5AKK was still hovering at a level of 57-58 or thereabouts.*

*I left the receiver listening to the VK5VF 2 m beacon for the remainder of the day, and it was audible well into the afternoon. Sunday morning there was no evidence of similar favourable conditions.*

### Broken Hill and the WIA AGM

Peter VK3KAI sent in this report of his trip to the WIA AGM:

*Having had my arm twisted firmly to attend the WIA AGM in Broken Hill, some very loose plans were formulated. I would have some company for the trip, so care was needed in not planning to spend too much time playing RF!*

*The car was fitted with a HF mount and 2 whips were available - a 40 m single band unit and an Outbacker multiband unit. The IC-7000 was fitted to the car in a temporary fashion - enough for reception on HF, but I had insufficient time to do things (such as grounding) properly. I also threw the homebrew 144 MHz Squalo and a short mast and 5-element Yagi into the car.*

*The trip started at 1730 local from Churchill, with a drive to and through Melbourne to Kyneton - fortunately the planned departure time meant that we missed the evening peak hour. A little 2 m and 70 cm FM operation occurred along the way (the Squalo was not "up"). I caught up with Barry VK3BJM via the phone and then the Mount Macedon repeater. As planned, we stopped in to enjoy dinner, a bottle of red, and a long chat before heading to bed.*

*In the morning, a short chat was had with Barry over coffee whilst having a quick look over the radio shack. Discussion included sites for potential activity near Broken Hill. Barry had the Friday off, so was relaxed, but with several tasks on the "to do" list. We departed from Kyneton at around 0830, again without any antennas fitted other than the FM vertical - Kyneton was very cold first thing after a clear, cloudless night!*

*We had a pleasant drive up the Calder Highway to Charlton, where we stopped for breakfast at 1005 - but convinced the coffee shop owner to make breakfast (kitchen was supposed to shut at 1000). Near the end of breakfast, I received a text message from Barry indicating that the Mildura beacon was audible. Following a brief chat, I fitted the 40 m whip and the 2 m Squalo to the car. Once everything was installed, we resumed the long drive. Just after we restarted, Barry called on 144.1 MHz. A very good 57/59 signal was received. We chatted briefly as I drove through the second half of town and onto the open highway. The next contact with Barry occurred briefly about 30 km short of Ouyen - a good haul for mobile! Signals were 52 to start with and fluctuated with the local terrain - local cuttings made Barry drop into the noise. From then on, it was just listening to the FM repeaters or occasionally to the activity on 40 m. The drive on to Mildura and then to Broken Hill was somewhat monotonous, with occasional FM contacts.*

*Once in Broken Hill, we settled into the motel room and then joined the crowd for a very pleasant meal at the Southern Cross Hotel. We were at a small table and were joined by an amateur and some friends from Bendigo. Much of the evening was spent discussing things VHF, UHF and above, as the Bendigo group were also interested in astronomy.*

*Despite the long drive on Friday and the long dinner, I was given a leave pass to play radio on Saturday morning. I headed off on the Menindee road, following Barry's description of a favourable location (QF07sx). I found the spot easily and was set up just before 2130 Z. I alerted Barry via SMS and then a quick call on the mobile. At 2131, contact was made via an aircraft travelling Adelaide to Sydney. The contact was short, but complete. Barry posted a message on the VK Logger as I started to get the laptop PC and interface together, just in case there was a chance of some MS contacts. I received a 'phone call from Steve VK2ZT and pointed the 5-element beam in the appropriate direction, but heard nothing. A little after 2200 (time not recorded), I received a 'phone call from Rex VK7MO. We talked about what was happening - I was having some issues with the laptop and the interface, as it had been a few years since I had tried to operate the system from the car and had not used it with the IC-7000 (yes - poor planning).*

*I finally got the system working and started trying on FSK441 with Rex at 2235. I had a complete contact in the log by 2242 - only seven minutes! I was amazed that it took so little time - I guess a quiet location helps! At some stage, Phil VK5AKK had called, but I did not receive notification of the voice message until late that afternoon: Sorry Phil.*

*I also ventured out again on Sunday to a nearby location, with the goal of working my home square via MS. Ralph VK3WRE was willing to try. I was set up and transmitting by 2135 and received several pings over the next hour or so from Ralph. Unfortunately, Ralph heard nothing from me and we gave up at 2250 after telephone contact.*

*So, two stations were happy that I had taken some limited gear with me - Barry had actually worked a new square (previously in the log via a reciprocal contact) and Rex had a new square. Unfortunately, no new square for me to add to my tally. Given the uncertainties of the trip, I did not wish to raise expectations of others, so made no prior announcement of any possible activity. Perhaps I can arrange another trip in the future....*

*The return trip was uneventful, with some more 2 m FM contacts. We stayed overnight on Sunday in Mildura - thanks to Geoff and Marilyn Syme. Christine VK5CTY was also staying at the Syme residence, so some lively discussion occurred. I had work commitments on Tuesday, so could not stay for the local Mildura activities on Monday evening. A long but un-eventual drive on Monday saw us safely home in the Latrobe Valley late in the afternoon.*

## Aircraft Enhancement

Here is another report from Barry VK3BJM. Interestingly, Barry is now using an ADS-B receiver to receive real-time position reports from aircraft in view of his antenna.

As background, the ADS-B system is a distant descendant of the Interrogate Friend or Foe radar system (IFF) where a ground-based radar sent a signal to interrogate a transponder on a military aircraft, which then replied with the appropriate code. The system has been extended over the years for both military and civilian use so that the radar can ask for different information. Thanks to onboard GPS systems, the aircraft now know their position accurately. ADS-B eliminates the need for the ground-based radar by having the aircraft periodically transmit a message that includes an identification and precise position. So, with a relatively simple receiver such as the Kinetics SBS-1, you can now have your own air traffic control display.

So, over to Barry, who also reports on the other side of the contact with Peter VK3KAI:

*Another interesting morning up here amongst the frosted grass of Kyneton. Peter VK3KAI had travelled up to Broken Hill for the WIA AGM, and this morning had travelled out to a spot where I had operated from during the 2007 Summer Field Day, a ridge about 15 km ESE of Broken Hill - locator QF07sx. I had left the array parked in the Broken Hill direction, and had also left my ADS-B receiver running, so on entering the shack the only hold-up was waiting for the AM-17 to warm up its clogs... As it was doing this I noted on the Radar two aircraft; one Sydney to Adelaide flight that had just passed the area for potential enhancement, and a Jetstar flight from Adelaide to Sydney just crossing the beam heading. As soon as the AM-17 was on line I called, and there was Peter at a solid 56. I received 55. There was enough time for two exchanges, then the signal dived - by the time the aircraft was 5 degrees away from the beaming heading to Peter, he was 41 and headed for the noise. This was at 2134 Z.*

*The aircraft track and the beam heading cross at about 65 degrees to each other, so the enhancement is brief, but strong. This spot is about 277 km from my QTH; Peter was 634km distant, so the aircraft track is well positioned for mutual visibility. The aircraft was at 37,000' at the time.*

*Later, during the usual AE activity, I had just returned to 144.200 after working Les VK3TJ in Mildura on 144.180, when I heard Steve VK2ZT in Medowie QF57wf. The time was 2244 Z. I had been hearing plenty of Steve since rebuilding my 2 m array, but due to distance of the path, the brevity of the AE "openings", and the level of activity on 144.200 these days, we had never completed a contact. Steve was regularly a comfortable 51 at these times. This time, as he worked Rob VK3XQ, he peaked at 53. Again the brevity of the opening beat me, as the signal fell away as the contact was completed. I made this observation on the VK Logger, and we agreed to try another frequency after 2300 Z. Settling on 144.140, we had two near misses at 2309 Z and 2314 with incomplete exchanges of 41, before completing at 2321 Z with reports of 51 both ways. Steve actually hit 52 in his last over. I still cannot tell for sure which aircraft are providing this path - it could be Melbourne>Sydney, or it could be Adelaide>Sydney, but it is reasonably regular. The path distance is 843 km, according to the distance calculator on the Logger. I think working over this distance via AE is actually more satisfying than the fact this contact was a new Grid Locator for me!*

*Once completed, I stayed on to try and do the same with Colin VK2KOL in Mt Druitt; this was a little harder but again, after two near misses we completed at 2337 Z with an exchange of 41 both ways. Colin's local noise issues (S2 at the end!) are not to be envied...*

*Unfortunately this morning there were no completed contacts on 1296 MHz with any of the VK1/2s - but we cannot have everything, I guess!*

## South-Eastern Australia Tour

It seems that it is the time of year for long drives through the countryside. Leigh VK2KRR penned the following piece on his ramble through southern VK5, visiting many amateurs and other sites that he has heard in various ways:

*Went for a bit of a drive over the Queen's Birthday long weekend into VK5. I was lucky enough to be able to call into a number of operators' QTHs and get a look at their shacks and operating conditions at their QTH.*

*Left my QTH (The Rock, near Wagga) at 9 am Saturday. First up, I stopped in at Barry VK3BJM's QTH at Kyneton at around 2 pm. It was awesome to come up a road and see a huge 4-Yagi array towering over a house. It was good to catch up with Barry and he was kind enough to check some specs of my IC-910 and I also got a preview of an awesome aircraft tracker he was running.*

*Next, it was the Mt Gambier AR convention. Met up with heaps of operators there, some I have met before and others only on radio so it was great to meet the new faces and catch up*

*with others. Of particular interest was catching up with Chris VK5MC. Chris was kind enough to invite me to call into his QTH on the way up to Adelaide. He drew me a 'mud map' and told me to just go up and have a look. He did not really explain about what he was working on.*

*Leaving Mt Gambier at around 11.30 am, I drove north for 30 mins or so and found the VK5MC QTH. Driving up the driveway, I could see a massive EME dish towering over the top of the house! I had a huge grin on my face :-) I pulled up and have just gone 'oh my god'! I was looking at around a 40 ft diameter dish pointing at the horizon! It was huge. Extremely impressed by Chris's monster homemade dish on his property in the middle of nowhere.*

*I then drove for hours and hours and eventually ended up at the QTH of Jeff VK5GF who has recently moved from Alice Springs to Victor Harbour. Jeff is still getting everything set up for his new location but it is looking all pretty good so far. I also got to see the actual QSL cards from his famous 144 MHz TEP contacts into Japan from Alice Springs, which was quite amazing to see.*

*Next stop on Monday was to Goolwa to see Garry VK5ZK. Was great to call in to see Garry's setup and chat about radio things. Also Harry VK5HR came down to Garry's to meet me while I was in the area which was great too as I have worked Harry a few times. Garry is just getting going on 1296 now which is great and when I arrived was doing a test with VK5BC over at Corny Point.*

*Then with some great assistance on simplex I headed on over to catch up with Bill VK5ACY (ex Kangaroo Island). Bill is now located to the south of Adelaide. As Bill has only recently moved he is still setting up his new QTH and cement was going down for the new tower as I arrived. Although I think Bill was a bit reserved about AR-DX possibilities from near the city, things are looking up and tests have been promising. I cannot wait till Bill has everything set up on the new tower to see how it goes.*

*With more great simplex directions from VK5ACY and VK5AKK, I headed up the hills to catch up with Phil VK5AKK. Phil is way up at the top of the range and is an interesting drive to get there for sure. Firstly I could not even see Phil's tower and antennas - there are so many trees about. But up the back of the block was the tower. The antennas are still slightly shielded by trees but the height is working well. I walked up to the highest point on the ridge and you could see virtually everywhere for a very long way. Phil has quite a long run of coax too to get to the antennas from the shack so quite a bit of loss, especially on 23 cm. I have to mention that I got the best meal of the whole trip while I was at Phil's QTH, as cooked up by his XYL. Thank you very much! I was never expecting to get a roast chicken with baked vegetables and gravy!! When she said something to eat I thought she meant like a piece of cake! OMG she should not have done that but I appreciated it!*

*By this stage it was around 3.30 pm and I really had to head off. I went via Murray Bridge then over to Loxton way. It was nice to use the legendary Murray Bridge repeater on a local level for something different. Out along the road to Loxton I tried to get Phil the QF04 grid square. I could hear him a fair way out but a vertical Yagi at his end would have been much better. Right out at some isolated little town for only a few kilometres was the NE corner of QF04. I could only hear him when near the Telstra tower, but Phil could not copy me.*

*Further along the track towards Loxton, now in the darkness I could see the red lights of a massive radio tower off in the distance, a long way away. As I got close I realised it was Renmark Channel 5A TV (or closer to Loxton really). I got closer and the whole 4 MHz of the 2 m band began to get wiped out! It was a totally full scale signal for MHz and MHz on my mobile rig - amazing. I tuned down to 143.760 and listened for a bit to the audio. It was great for me to drive past this great big radiator all alone in the middle of nowhere, as Renmark TV audio is something I have always referred to as a beacon for the past 5 years or so and having studied the signals from it on many occasions. It was great to see its origin.*

*Next up, I called into Mildura and was greeted by Les VK3TJ who kindly drove down to McDonalds to catch up and have a chat. Garry VK3KYF kept me company on the Mildura and Robinvale repeaters for as long as they would go, then just the long, long trip home across the plains. I arrived home around 4 am Tuesday morning.*

*Thank you to everyone for your kind hospitality, it was great and very inspirational to call into such a prominent group of DXers QTHs and see their setups and what challenges are presented with the local terrain and other issues. The knowledge and experience of these guys is amazing.*

*My apologies to VK5BC and VK5ZLX, just ran out of time to call up to the Barossa. I could have spent a whole day up there though I reckon. Next time hopefully.*

## SK – W4RNL and DJ9BV

It has been a sad time for the amateur community recently, particularly in the area of antenna development.

In April, it was announced that L.B. Cebik W4RNL had become SK. LB was the Technical Editor for the antenneX Online Magazine and a regular monthly contributor with his antenna modelling column. I always found his web site to be of great value when researching antenna options. Fortunately this site will be maintained and is highly recommended - www.cebik.com. His valuable additions will be sorely missed.

Then in early June came the announcement that Rainer DJ9BV had passed away after a long illness. Any of you who have built your own VHF/UHF Yagi would be well aware of Rainer's work optimising the DL6WU Yagi designs. His designs are, in my opinion, still the best you can build. Again, he will be sadly missed.

## VK logger improvements

The VK Logger (www.vklogger.com) has received a major overhaul. Adam VK4CP has been burning a lot of midnight oil in completely rewriting the code for the site to take advantage of new web technology. While the look and feel of the site is basically the same, there have been many detail improvements. Visit the Help section in the Forum area for more details.

As of early June, the VK Logger now has 573 registered users.

## More stations on 23 cm

I reported some time ago on the increase in activity on the 23 cm band in the VK3 area. Brian VK5BC reports that VK5 is having a similar boom:

*Activity and interest in 1296 in SA is on the increase. Latest stations to add 1296 capability to their stations are Garry VK5ZK, Graham VK5KGP and Jeff VK5GF. These stations are all located in the Goolwa/Victor Harbor region south of Adelaide and are ideally placed for contacts to the east. I managed a scatchy contact with Garry this afternoon. This is just over 100 km over a less than ideal path.*

*There are several other existing active stations on 1296 including Phil VK5AKK, Roger VK5NY, Ron VK5KRA, Keith VK5AKM and Peter VK5ZLX. There are also some including John VK5BJE planning to be on 1296 shortly.*

Please send any Weak Signal reports to David VK3HZ at vk3hz@wia.org.au.

## Digital DX Modes

**Rex Moncur VK7MO**

With winter upon us, meteor scatter using WSJT's FSK441 mode is a good way of working long distances on 2 metres – up to 2000 km. Activity sessions are held on each Saturday and Sunday morning as follows in local NSW/VIC times:

0500 to 0600: 144.330 ZL to VK with ZL transmitting first period

0600 to 0700: 144.230 ZL North Island to ZL South Island, South first period

0600 to 0700: 144.230 VK to VK – unstructured

0700 to 0800: 144.230 Saturday VK3/5/7, first period to VK1/2/4

0700 to 0800: 144.230 Sunday VK1/2/3/5/7, first period to VK4

Some of the regular ZL operators are Bob ZL3TY (Greymouth), Starr ZL3CU (Christchurch) and Peter ZL4LV (Dunedin). In VK, regular operators are Waldis VK1WJ, Dave VK2AWD, Colin VK2KOL, Mark VK2EMA, Gavin VK3HY, Peter VK3SO, Jim VK3II, Rhett VK3VHF, Wayne VK4WS, Phil VK4CDI, Alan VK4EME, John VK4JMC, Peter VK5ZLX and Rex VK7MO.

Joe Taylor K1JT is developing a new Digital mode called WSPR that is aimed primarily at propagation tests on HF. It runs in a total bandwidth of 6 Hz making it possible for a large number of stations to run tests in just 200 Hz of bandwidth. The program searches the full 200 Hz to which you are tuned and prints out a list of all stations it can decode. Rex VK7MO has been testing this program with Jim VK3II and David VK3HZ and it works well at two metres, with signal levels down to around -27 dB on the WSJT scale. Rex also tested it with K1JT via EME and despite the narrow bandwidth it still works well and coped with libration frequency spreading. The initial tests gave decodes down to -27 dB but subsequently Joe was able to use these test files to improve the decoder down to -29 dB. Joe has advised that he is looking to develop a QSO version of WSPR.

Please send any Digital DX Modes reports to Rex VK7MO at rmoncur@bigpond.net.au.

**ar**


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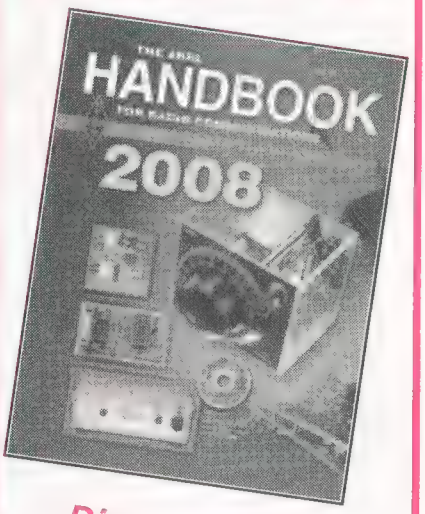


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# Gridsquare Standings at 13 June 2008

## 144 MHz Terrestrial

| | | |
|---|---|---|
| VK2FLR | Mike | 113 |
| VK3NX | Charlie | 106 |
| VK2KU | Guy | 102 |
| VK3KAI | Peter | 87 |
| VK3HZ | David | 80 |
| VK2ZAB | Gordon | 78 SSB |
| VK2DVZ | Ross | 72 SSB |
| VK3CY | Des | 71 |
| VK3PY | Chas | 71 SSB |
| VK5AKK | Phil | 70 |
| VK2KU | Guy | 69 SSB |
| VK2ZT | Steve | 64 SSB |
| VK7MO | Rex | 63 |
| VK2TK | John | 62 |
| VK3QM | David | 61 SSB |
| VK2EI | Neil | 59 |
| VK3BJM | Barry | 58 SSB |
| VK3BDL | Mike | 54 SSB |
| VK3KAI | Peter | 54 SSB |
| VK3ZLS | Les | 51 SSB |
| VK3WRE | Ralph | 50 SSB |
| VK2KU | Guy | 47 Digi |
| VK3CAT | Tony | 46 |
| VK3VG | Trevor | 46 SSB |
| VK5BC | Brian | 46 SSB |
| VK4CDI | Phil | 45 |
| VK7MO | Rex | 45 SSB |
| VK4KZR | Rod | 43 |
| VK7MO | Rex | 43 Digi |
| VK4CDI | Phil | 41 SSB |
| VK5BC/p | Brian | 41 SSB |
| VK3II | Jim | 39 |
| VK3II | Jim | 38 SSB |
| VK3KAI | Peter | 36 Digi |
| VK2TK | John | 35 SSB |
| VK2KOL | Colin | 34 SSB |
| VK3ZUX | Denis | 33 SSB |
| VK6HK | Don | 33 |
| VK2AMS | Mark | 32 SSB |
| VK3DMW | Ken | 32 |
| VK2TG | Bob | 30 SSB |
| VK3VHF | Rhett | 29 SSB |
| VK4TJ | John | 29 SSB |
| VK2EAH | Andy | 27 |
| VK2TK | John | 27 Digi |
| VK1WJ | Waldis | 26 |
| VK3ACC | Gordon | 26 SSB |
| ZL3TY | Bob | 24 |
| VK3TLW | Mark | 23 SSB |
| VK4EME | Allan | 23 |
| VK1WJ | Waldis | 22 Digi |
| VK3BG | Ed | 22 SSB |
| VK3II | Jim | 21 Digi |
| VK4CDI | Phil | 20 Digi |
| VK6KZ | Wally | 20 |
| VK4EME | Allan | 19 SSB |
| VK3AL | Alan | 18 SSB |
| VK3UDX | Geoff | 17 SSB |
| VK2EAH | Andy | 16 SSB |
| VK3ECH | Rob | 16 SSB |
| VK6KZ/p | Wally | 16 |
| VK3VHF | Rhett | 12 Digi |
| VK4EME | Allan | 12 Digi |
| VK2EAH | Andy | 11 Digi |
| VK2EI | Neil | 11 Digi |
| VK2KOL | Colin | 9 Digi |
| VK2ZT | Steve | 8 Digi |
| VK6DXI | Mirek | 6 |
| VK6HK | Don | 6 Digi |
| VK1WJ | Waldis | 5 SSB |
| VK1WJ | Waldis | 5 CW |
| VK4AIG | Denis | 5 SSB |
| VK4JAZ | Grant | 3 FM |
| VK3QM | David | 1 Digi |

## 144 MHz EME

| | | |
|---|---|---|
| VK2KU | Guy | 278 |
| ZL3TY | Bob | 277 |
| VK2KU | Guy | 266 Digi |
| VK3AXH | Ian | 207 Digi |
| VK7MO | Rex | 155 Digi |
| VK4CDI | Phil | 142 Digi |
| VK2FLR | Mike | 120 |
| VK3CY | Des | 70 CW |
| VK2KU | Guy | 39 CW |
| VK2ZT | Steve | 29 Digi |
| VK3VHF | Rhett | 20 Digi |
| VK3HZ | David | 19 |
| VK3II | Jim | 10 Digi |
| VK3NX | Charlie | 5 |
| VK4EME | Allan | 5 Digi |
| VK3AXH | Ian | 3 CW |
| VK2DVZ | Ross | 2 CW |
| VK3AXH | Ian | 1 SSB |

## 432 MHz Terrestrial

| | | |
|---|---|---|
| VK2ZAB | Gordon | 57 SSB |
| VK3NX | Charlie | 50 |
| VK3PY | Chas | 50 SSB |
| VK3QM | David | 48 SSB |
| VK3ZLS | Les | 40 SSB |
| VK2KU | Guy | 38 |
| VK3HZ | David | 37 |
| VK3BJM | Barry | 36 SSB |
| VK2KU | Guy | 34 SSB |
| VK5AKK | Phil | 34 |
| VK2DVZ | Ross | 32 SSB |
| VK3CY | Des | 32 |
| VK3BDL | Mike | 30 SSB |
| VK3KAI | Peter | 30 |
| VK3KAI | Peter | 29 SSB |
| VK3WRE | Ralph | 28 SSB |
| VK5BC | Brian | 21 SSB |
| VK3VG | Trevor | 20 SSB |
| VK7MO | Rex | 20 |
| VK2ZT | Steve | 19 SSB |
| VK3UDX | Geoff | 19 SSB |
| VK2TK | John | 18 |
| VK7MO | Rex | 18 SSB |
| VK2TK | John | 17 SSB |
| VK3CAT | Tony | 16 |
| VK3BG | Ed | 15 SSB |
| VK3TLW | Mark | 15 SSB |
| VK3ZUX | Denis | 15 SSB |
| VK5BC/p | Brian | 15 SSB |
| VK4KZR | Rod | 14 |
| VK4CDI | Phil | 13 |
| VK4CDI | Phil | 13 SSB |
| VK6KZ | Wally | 13 |
| VK2KOL | Colin | 12 SSB |
| VK2EI | Neil | 10 SSB |
| VK2TG | Bob | 10 SSB |
| VK3AL | Alan | 10 SSB |
| VK2AMS | Mark | 9 SSB |
| VK3VHF | Rhett | 9 SSB |
| VK4TJ | John | 8 SSB |
| VK6KZ/p | Wally | 8 |
| VK7MO | Rex | 7 Digi |
| VK2FLR | Mike | 6 |
| VK3ECH | Rob | 6 SSB |
| VK4EME | Allan | 6 SSB |
| VK6DXI | Mirek | 6 |
| VK2KU | Guy | 5 Digi |
| VK1WJ | Waldis | 4 SSB |
| VK2EAH | Andy | 4 SSB |
| VK3DMW | Ken | 4 |
| VK3KAI | Peter | 4 Digi |
| VK3PY | Chas | 4 Digi |
| VK3QM | David | 4 Digi |
| VK4CDI | Phil | 4 Digi |
| VK3VHF | Rhett | 3 Digi |
| VK4AIG | Denis | 3 SSB |
| VK4JAZ | Grant | 3 FM |
| VK2KOL | Colin | 1 Digi |
| VK2TK | John | 1 Digi |

## 432 MHz EME

| | | |
|---|---|---|
| VK4KAZ | Allan | 14 CW |
| VK4CDI | Phil | 11 Digi |
| VK7MO | Rex | 10 |
| VK7MO | Rex | 9 Digi |
| VK3NX | Charlie | 5 |
| VK3HZ | David | 4 |
| VK2ZT | Steve | 1 Digi |
| VK3AXH | Ian | 1 Digi |
| VK3VHF | Rhett | 1 Digi |
| VK5BC | Brian | 1 |

## 1296 MHz Terrestrial

| | | |
|---|---|---|
| VK3PY | Chas | 39 SSB |
| VK3QM | David | 39 SSB |
| VK3NX | Charlie | 37 |
| VK2ZAB | Gordon | 29 SSB |
| VK3ZLS | Les | 26 SSB |
| VK2KU | Guy | 25 |
| VK2KU | Guy | 22 SSB |
| VK3KAI | Peter | 20 |
| VK2DVZ | Ross | 19 SSB |
| VK3KAI | Peter | 19 SSB |
| VK3KWA | John | 19 |
| VK5AKK | Phil | 19 |
| VK3WRE | Ralph | 17 SSB |
| VK3BDL | Mike | 16 SSB |
| VK3BJM | Barry | 16 SSB |
| VK3HZ | David | 16 |
| VK3VG | Trevor | 12 SSB |
| VK3BG | Ed | 11 SSB |
| VK7MO | Rex | 11 SSB |
| VK2TK | John | 10 SSB |
| VK3UDX | Geoff | 10 SSB |
| VK4KZR | Rod | 10 |
| VK2ZT | Steve | 8 SSB |
| VK3TLW | Mark | 8 SSB |
| VK3AL | Alan | 7 SSB |
| VK3ECH | Rob | 5 SSB |
| VK3VHF | Rhett | 5 SSB |
| VK3ZUX | Denis | 5 SSB |
| VK4TJ | John | 5 SSB |
| VK6KZ/p | Wally | 5 |
| VK4CDI | Phil | 4 |
| VK6KZ | Wally | 4 |
| VK2KU | Guy | 3 Digi |
| VK4CDI | Phil | 3 SSB |
| VK4EME | Allan | 3 SSB |
| VK5BC | Brian | 3 SSB |
| VK6DXI | Mirek | 3 |
| VK7MO | Rex | 3 Digi |
| VK2FLR | Mike | 2 |
| VK3CY | Des | 2 |
| VK3DMW | Ken | 2 |
| VK3KAI | Peter | 2 Digi |
| VK3QM | David | 2 Digi |
| VK4AIG | Denis | 2 SSB |
| VK2AMS | Mark | 1 SSB |
| VK4CDI | Phil | 1 Digi |
| VK5BC/p | Brian | 1 SSB |

## 1296 MHz EME

| | | |
|---|---|---|
| VK7MO | Rex | 27 |
| VK7MO | Rex | 24 Digi |

## 2.4 GHz Terrestrial

| | | |
|---|---|---|
| VK3PY | Chas | 15 SSB |
| VK3QM | David | 15 SSB |
| VK3NX | Charlie | 14 |
| VK3WRE | Ralph | 10 SSB |
| VK3KAI | Peter | 7 SSB |
| VK3HZ | David | 5 |
| VK6KZ | Wally | 4 |
| VK3BJM | Barry | 3 SSB |
| VK3KAI | Peter | 2 Digi |
| VK3VHF | Rhett | 2 SSB |
| VK4KZR | Rod | 2 |
| VK2DVZ | Ross | 1 SSB |
| VK3BG | Ed | 1 SSB |
| VK3TLW | Mark | 1 SSB |
| VK3ZUX | Denis | 1 SSB |

## 2.4 GHz EME

| | | |
|---|---|---|
| VK3NX | Charlie | 17 |
| VK7MO | Rex | 9 |
| VK7MO | Rex | 7 Digi |

## 3.4 GHz Terrestrial

| | | |
|---|---|---|
| VK3NX | Charlie | 11 |
| VK3QM | David | 9 SSB |
| VK3WRE | Ralph | 7 SSB |
| VK3KAI | Peter | 6 SSB |
| VK6KZ | Wally | 4 |

## 3.4 GHz EME

| | | |
|---|---|---|
| VK3NX | Charlie | 5 |

## 5.7 GHz Terrestrial

| | | |
|---|---|---|
| VK3NX | Charlie | 12 |
| VK3WRE | Ralph | 9 SSB |
| VK3QM | David | 8 SSB |
| VK3KAI | Peter | 7 SSB |
| VK6KZ | Wally | 4 |
| VK3BJM | Barry | 2 SSB |
| VK3KAI | Peter | 2 Digi |
| VK6BHT | Neil | 2 SSB |
| VK3ZUX | Denis | 1 SSB |

## 5.7 GHz EME

| | | |
|---|---|---|
| VK3NX | Charlie | 11 |

## 10 GHz Terrestrial

| | | |
|---|---|---|
| VK3NX | Charlie | 11 |
| VK3QM | David | 11 SSB |
| VK3KAI | Peter | 9 SSB |
| VK3PY | Chas | 9 SSB |
| VK3WRE | Ralph | 9 SSB |
| VK6BHT | Neil | 9 SSB |
| VK3HZ | David | 7 |
| VK6KZ | Wally | 5 |
| VK3TLW | Mark | 3 SSB |
| VK2EI | Neil | 2 SSB |
| VK3BJM | Barry | 2 SSB |
| VK3DMW | Ken | 2 |
| VK3ZUX | Denis | 2 SSB |
| VK7MO | Rex | 2 |
| VK3BG | Ed | 1 SSB |
| VK4KZR | Rod | 1 |

## 10 GHz EME

| | | |
|---|---|---|
| VK3NX | Charlie | 11 |

## 24 GHz

| | | |
|---|---|---|
| VK6BHT | Neil | 3 SSB |
| VK2EI | Neil | 2 SSB |
| VK3NX | Charlie | 2 |
| VK6KZ | Wally | 2 |

## 474 THz

| | | |
|---|---|---|
| VK3HZ | David | 2 |
| VK7MO | Rex | 2 |
| VK7MO | Rex | 2 Digi |
| VK7TW | Justin | 2 |
| VK7HAH | Ben | 1 Digi |
| VK7TW | Justin | 1 Digi |

Additions, updates and requests for the guidelines to Guy VK2KU.

The guidelines (and the latest League Table) are also available on the VK VHF DX Site at www.vhfdx.radiocorner.net - click on Gridsquares.

Next update of this table will close on or about 17 October 2008.

Stations who do not confirm their status for more than 12 months may be dropped from the table.

## Morris William Cookson VK2BIG

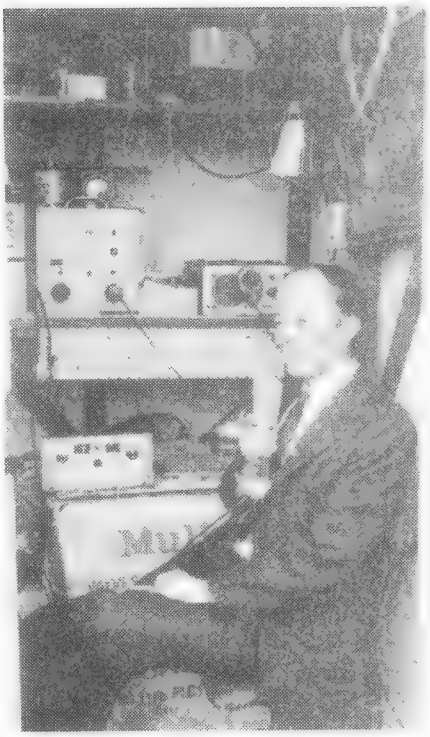
### 1925-2008

Morrie VK2BIG as he was known on-air and to his friends, had been ill at home for a couple of years. In October 2007 following a hospital stay, he went to The Abbey Nursing Home, Mittagong, NSW, and passed away on 26 February 2008.

In his younger days, Morris was a keen mobile amateur radio operator on the HF and 2 metre bands in NSW. In addition to the amateur radio call sign VK2BIG, Morris also held the scientific and experimental call sign VH2T. Following his WWII RAAF service, he worked as a hearing aid technician, ran his own transformer manufacturing business, and was an engineer and consultant for IBM and for AWA Marine Services. From the late 1970s he worked as a radio officer on ANL (Australian National Line) ships, both international and coastal. In the early 80s he was on the container ships of the Eastern and Australian Steamship Company. His final years at sea were with BHP Pty Ltd on coastal, Japan and Korea bulk ore trades, until in 1991 the radio officer's position was abolished due to introduction of maritime satellite communication and navigation. Morris then retired, to live at Round Corner, Dural, NSW. During his years at sea, he often operated as VK2BIG/MM. Some of the ships he served on were MVs Lake Eyre, Mittagong, Yarra River, Lake Barrine, Ariake, Australian Escort, Iron Carpentaria, Australian Prospector, Iron Mittagong and Iron Kembla.

A summary of Morris' WWII RAAF service history follows: He enlisted with the Royal Australian Air Force in 1943 and following his initial training he was posted to Wireless School, Tuxedo, Canada, and then to Air Gunnery School, Alberta. Following these Canadian air training schools, he returned to Australia to be posted as an instructor to the RAAF Wireless and Gunnery School Ballarat and later to Air Observer School Mount Gambier. Morris was promoted to Flight Sergeant in 1945 and discharged from the RAAF in 1946.

Morris had excellent technical skills and until recently was active with computer support for his friends, home constructed electronics and his specialty, ensuring his dipole antennas were resonant and with low SWR on his home constructed PC driven HF spectrum sweeper. For three months in 2001, Morris VK2BIG, Geoff VK2OI and David VK2AWD provided the invaluable service of almost daily contact with Australia for my wife Josette and me, during a medical mission trip to the Solomon Islands. At that time, when power was available I operated as H44MA from a small mission hospital at Atoifi, Malaita, where the only communication available was via HF radio.



A younger Morris Cookson VK2BIG in his shack in 1972.

Morris assisting with a JOTA operation at Castle Hill in October 2000.

Morris is to be remembered for his humour; when asked how he was, the answer was always "I'm fit as a scrub bull" and on parting the reply was "see you when you are older". Morris was a very good friend and is sadly missed.

**Submitted by Allan Mason VK2GR**

# So you want to give CW a try?

Brett Rees VK2TMG

**When they dropped the CW requirement for HF back in 2005, I thought 'Great, now I can get on HF and ragchew and work contests and DX'. And that I did, and it was fun. Then I played around with digital modes such as PSK31 and MFSK16, and digital decoding of CW, using a Linux program called fldigi – see http://w1hkj.com/ if you are interested. This got me thinking about CW, as I could often hear CW in my radio's pass band whilst working digital modes. I did some investigation, and found that CW can be just as good S/N wise as the common digital keyboarding modes. I was hooked and had to learn more.**

But what are some of the benefits of CW? That 10 W (if you are an F-call) or 100 W from the standard Japanese 21st Century set packs quite a punch when received at the other end through a 300 Hertz filter and an operator with years of experience. We are not talking PEP and compressors here, we are talking pure unadulterated carrier. And even a cheap radio when fitted with an optional CW filter will allow you to hear quite well. I started with a cheap Alinco radio and even with the standard SSB filter for receive was able to make DX QSOs. You can too.

Now, I researched how to learn CW before I started. It is not a matter of working at it - you need to have the desire as well as the ability to effortlessly work CW. Listening is the hard part, and is best enhanced by spending time listening to CW. But more of that later. Right now, if you want to learn CW you first have to learn the characters. As you progress, you will know them better and better. I used to be afraid that I would forget them but that feeling fades. The best way to learn the characters is to drill yourself using a computer program or friend with a key. You can do this on-air - your licence allows it and OTs love to hear newbies learning CW - you will only earn encouragement.

A great computer program for learning the characters can be found at http://c2.com/morse/, where you can find 'A Fully Automatic Morse Code Teaching Machine' by Ward Cunningham, first described in QST in May, 1977. Now this is the drill learning machine; it starts with a few characters and as you get them correct it adds more – 'automagically'. When you can confidently run it to the end then you know your characters. Make sure you keep the character speed high – like 15 words per minute - as you want to learn the sound and rhythm of the characters, not hear dits and dahs and then decode them from a lookup table. That is the hard way. Ward has versions available for Linux, Windows, DOS and Mac, and it is good stuff.

I talked before about desire. You need to understand that you can do this - lots of people before you have. There is a great ebook available for free on the Net called 'The Art and Skill of Radiotelegraphy', by William G. Pierpoint N0HFF, and an html version can be found at http://www.raes.ab.ca/TASRT/index.html. A PDF version is also available if you Google for it - send me an email at breree@gmail.com and I will gladly send you a copy. This book by N0HFF is not only good in a teaching sense, but is also inspiration and confidence inspiring. It is definitely worth a read.

So, you know the characters, it is now time to move to the second stage of training. Find some locals doing code practice and participate. Call-backs and reading of the text are normally done in SSB so even if you can not copy the faster code you can still join in. Amateur Radio NSW runs slow code practice at 8 pm local on 3550 kHz, and Ross and Alan, I am sure, would like to hear from new operators. The format is that they start slow at about 5 wpm (easy after using the c2.com program) and move up in increments to 12 or 20 wpm. I found the best way for me was to copy on my computer as I work on a keyboard all day and can type much better than I can write. So listen, and soon you will get the format, the callsigns and CT and AR and de. There are regular call-backs from VK7 and sometimes VK6 - if you are east coast and have a reasonable antenna (such as a dipole running East-West) then you should be able to participate in these sessions.

Meanwhile, passive listening can help you improve your skills with very little investment on your behalf, apart from leaving your HF rig sitting on the ARNSW beacon on 3699 kHz. Right now, at the bottom of the solar cycle, I can hear this beacon about 20 hours a day, with it only dropping out in mid-afternoon. Just leave it running in the shack, and let the CW permeate your brain. Program in your local repeaters as well on your VHF/UHF gear - soon you will be able to know which repeater ID'd without looking at the frequency. When you hear one, think of its call. Finally, there is a beacon network you can listen to on 14100 kHz run by NCDXF. You can run any number of 'International Beacon Network' or IBP clients that will show you which beacon is transmitting at any time. Just sync your computer's clock with NTP to make sure it is correct and run your client. For Linux, try (surprisingly) a program called ibp. With a zero sun spot number ZL6BP can be heard here most afternoons S9, and I also hear VK6RBP, North America, Hawaii and Sri Lanka, and the ibp program will tell you what you should be hearing at any one time. All with a wire dipole on the Alinco with a CW filter.

Once you have your listening progressing well you can try sending. I started on a straight key but found it extremely tiring. I considered a keyboard

for sending but wanted this to be about radio, not computers. I picked up on eBay a Bencher paddle and MFJ keyer combo, and I must say, playing with an iambic keyer is a lot of fun. Most modern radios have an Iambic keyer built in, and you can make a paddle using a few paper clips if necessary, although sometimes if you wait to homebrew something then you may never get on-air.

So beg, borrow or buy yourself a key or paddle; I suggest one of each. Each has its virtues: I like to use my straight key when tuning up. It is nice to have that wooden knob and you press it and you radiate. You need text to send which reflects what you will send on air, with little punctuation. A club member list is good, as you can send callsigns and first names and practice and learn some valuable information about people at the same time.

Oh yes, of course work out how to do this without putting a signal to air - most radios allow you to disable the break-in and just generate side tone. The final thing you can do is to learn to send in your head. Try it now - R - didahdi. Say it out loud. Now think it. See, it is easy, and a great source of practice is sending car number plates, road signs or any text to hand. I have even sent the text off a roll of loo paper!

Finally, it will be time to call CQ and make your first QSO. My first was with VK4BZ John in QLD - what an adrenaline exercise that was. 80 m is good for this as it can be relatively devoid of signals in the CW section so you can get away with a wide filter if that is all you have. I always found success at 3525 kHz: it seems to be a bit of a party line! Keep it short, just RST, name and QTH and then sign off – easy. And do not forget to QSL, and be a member of the WIA, and register your address with your local bureau as CW operators are great QSLers. The service is free for members, so all it costs is the occasional 50 cent stamp to send in a bundle of cards.

Now you are a CW operator. You can do EME, home-brewing or DX on the bottom end of 40 m – the world is your oyster.

**73 es gud dx de VK2TMG**

# Silent keys

## William (Bill) Simon Bond VK3BWS

### 15-11-1914 to 13-10-2007

Unfortunately we recently had to farewell one of our foundation members and past President of the Geelong Radio and Electronics Society. A well respected man who worked hard during the formative years of a club he was passionate about.

Bill was born in the small Victorian country town of Moriac. His father was a farmer, blacksmith and inventor. At the age of 14 and encouraged by his father Bill constructed his first crystal set. This radio is still in working order today. The family moved to Geelong, and it was here that Bill built a model railway in the garden of the family home. This was complete with lights and points, and the local children loved riding on it.

His military service was done at Queenscliff. At first he was in signals, but later due to his love of motor bikes he became a dispatch rider. Then, during World War 2 he was employed in a light engineering business where they made nuts, bolts and Morse code keys. These were for the armed services and because of this he was exempt from overseas duty.

After the war Bill started his own business repairing radios and operating a mobile public address van. Unfortunately due to ill health he spent a prolonged time in hospital, which ended his radio repair business. He then joined the PMG (now Telstra) as a technician. Initially he worked on country installation and then at the Geelong exchange, where he remained until his retirement. In 1958 he built the family's television receiver, which remained in use for the next 18 years.

When the GRES was formed Bill was a foundation member. He worked hard to help build the new clubrooms, and it was because of his efforts that one room was a superb audio studio. This was complete with control room that doubled as a projection room. Bill sourced many technical films from the PMG library and these were screened every month. He also started a museum which grew to be quite large. It contained old domestic valve radios, military radios and telephone equipment. News of this collection spread and many people visited Geelong just to see the collection. A conservative estimate of its value in 1995 was $50,000.

After years of gentle persuasion by club members Bill finally obtained his amateur licence and was issued the call sign VK3BWS. He was active on HF and loved to chase the many awards on offer. He was also active on two metres and part of a very active group on 70 cm transmitting fast scan amateur television. When not operating on air he would devote his time to restoring old valve radios. He had a vast knowledge in this area and his advice was often sought by other restorers when they encountered problems.

It is because of people like Bill that clubs and organisations prosper: People who are loyal and hard working. We were fortunate to have had Bill as a member.

**Submitted by Rod Green VK3AYQ**
On behalf of the GRES

## Lloyd Cherry VK7BF

It is with deep regret that we announce the passing of Hobart local Lloyd Cherry VK7BF.

Lloyd lost his battle for life following a four year illness. Lloyd passed away in hospital with his wife Trish by his side. Lloyd was 62 years young.

Earlier in Lloyd's life, he was active with the local radio club and the WIA.

Farewell Lloyd from all your radio amateur friends.

**David Ryan VK3DLR**

*(see also VK7 notes)*

***Plan ahead***

***16 & 17 August***

**Remembrance Day Contest**

# Hamads *classifieds* FREE

## FOR SALE NSW

• RACIAL AIMEC modulation meter type 409 3 MHz to 600 MHz up to 1200 MHz on harmonics. AIMEC wave analyser type 248A 5 MHz to 300 MHz. Consider any reasonable offer. Arthur VK2DKF QTHR Ph 02 4739 8695

• At this time I have 2 ICOM IC-F3 for sale. They are used but in good condition, and programmed with 32, 2 metre frequencies. I can get the programming changed for your favourite programs. 5 watts. They look like the CB IC-40s or the Amateur IC-T2.They use the same batteries. These radios are ready to go and you do not have to risk eBay business. Serial numbers will be given later. $50, $65 with antenna. You can buy a new battery at most 2-way radio shops or I will sell you a good second hand one at half price. These prices are negotiable.Victor.VK2XVS QTHR .Ph 0435 096 995.

• ICOM 7400 HF/50/144 MHz all mode transceiver purchased 28-04-05. Cost new $2699.00. Will sell for $1400 + post, operates on 13.8 volts D.C. Modes are USB,LSB,CW,RTTY,AM and FM. Output Power 5 to 100 watts continuously adjustable. General coverage receive 0.030 to 60.000 MHz.Transmit and receive all ham bands including 50 MHz and 144MHz. It also has 3 separate PL259 antenna connections on the back. It also has an automatic internal antenna tuner. Serial No.0301893.The unit is in exec. cond. with no modifications and no scratches at all. It has only been used a few times on 160 m and 80 m, and a few times on 2 m. It comes with everything – original purchase dockets, manuals, schematics, original packing, microphone etc. It is a very comprehensive unit which will do a host of things to numerous to mention here (104 page Manual). ICOM AH-710 folded dipole antenna. Purchased 3-05-05. Frequency range 1.9 MHz to 30 MHz. Power rating 150 watts. Length 24.5 metres (80.4 feet), with coaxial feed line. Cost new $450.00. Will sell for $220.00 + post. It has been strung between 2 trees but is in good to exec. cond. Again it comes with everything the same as the transceiver above – original purchase docket, manual, packing etc. Brian VK2MQ, Ph. 02 6947 1213 mobile.0407 004 071.

## WANTED NSW

• HALLICRAFTERS speakers: Model R-46B (or R-46A, R-46) and Model R-48 (or R-48A). Greg Price VK2GWP mobile 0411 289 327. Phone 02 4958 1541 or email vk2gwp@bigpond.com

## FOR SALE VIC

• ICOM IC-751A inbuilt P/S, wkshop man. Desk mike, orig packing/one owner good condtn $500. Twelve el 2 m beam on grnd, constructed $100. Alumin ext ladder 20ft $100. Geoff VK3ED 03 9746 1438 or email gbutters@bigpond.com

• KENWOOD TM-2570A 2 metres FM 70 watt transceiver. In original box with cradle, microphone and handbook. In excellent condition. $165 ONO. Yaesu FT-712RH UHF FM transceiver. 25 watts, in original box with cradle, microphone and handbook. Good condition $150. KENWOOD TK-210 commercial VHF handheld. Programmable, has 12 channels on 2 FM (has five repeaters and six simplex channels) 1/5 watts with desk top charger. $75 ONO. Ian Keenan VK3XI QTHR Parkdale. Ph 03 9580 6627 or email: ikeenan@bigpond.com.au

## WANTED VIC

• Manual for BWD Model 521. kinoaf@bigpond.com

• I am looking for a GENERAL RADIO GR-1931A modulation monitor. John Eggington VK3EGG, email: vk3egg@optusnet.com.au, mobile:-0409 234 672

• I am looking for an optional AM Unit (CPB-1556) for a YAESU FT-301 transceiver. Also looking for the optional AM and CW filters (or suitable filters) for the FT-301. Roderick Wall VK3BKO. Phone: 0413 074 386 or email: vk3bko@wia.org.au

• Early YAESU HF Transceiver FTDX-100. These were on the market in the late 1960s. May be working or non working - but otherwise complete and mechanically sound. Happy to discuss a suitable remuneration, external appearance to be reasonable considering age! Contact: Ian VK3XI QTHR, email ikeenan@bigpond.com.au or ph 03 9580 6627

## FOR SALE SA

• AWA VOLTOHMIST Multimeter with original leads very good clean condition reads to 500 Mohms $50 plus $15 p and p. Jack Martin VK5EJ Box 454 Port Lincoln 5606 08 8682 3131 jackmwtadaust.org.au

• The very popular VK5JST Antenna Analyser kits (see AR article May 2006) Build yourself an extremely useful item for your shack, and improve your HF antenna efficiency. For more details see www.scarc.org.au; contact SCARC PO Box 333 Morphett Vale SA 5162, or email: kits@scarc.org.au

## WANTED SA

• Headphones suitable for amateur receivers need to be good type with good earpads will pay reasonable price for suitable phones. Phone Murray VK5BVJ on 08 8723 1001 any time.

• HMV KIMBERLEY 4 band Transistor Portable radio Multi Band Brenton 08 8254 1196 Mobile 0430 270 466

## FOR SALE WA

• Log periodic array antenna. ATN 13-30-8. Never assembled. All fittings still in original packaging. Comes complete with CREATE RC5-1 rotator, also never used. Both items part of deceased estate of VK6MF. Items are located Perth Western Australia. $1500 the lot. Inspection welcomed. Contact Kim Mellows, 08 9279 3588 or email kimbo@eftel.net.au

## MISCELLANEOUS TAS

• Swap early PMG Morse key 1912 12/2 G C. Will swap for Hi-Mound single paddle key. Contact VK7ZW phone 03 6426 2609

## FOR SALE NT

• BUDDIPOLE portable HF antenna. As seen at www.ttssystems.com.au/index_files/Page642.htm Antenna length extended is 9.5 feet (length collapsed 56 cm). Rated up to 250 watts and weighs 1 kg. Covers 7-54 MHz and 144-148 MHz. Includes the 16 ft BUDDIPOLE mast so full height of ant is 19 feet. This Buddipole deluxe package includes 25 ft coax assembly, tripod, 8ft and 16ft portable masts, extra 3 stainless steel telescopic whips and the main two long telescopic whips. I purchased these 4 months ago from TTS Systems, the cost was BUDDIPOLE Deluxe Package $630, 2 long telescopic whips $60 and 16 foot Buddipole Mast $165, TOTAL $855 for me to buy new. Am selling this for only $450 with free postage anywhere in Australia. Reason for sale is I am getting a tower and Yagi and don't need this antenna anymore. Call Craig VK8FGNT on 0427 197 220.

## About hamads....

- Submit by **email (preferred)** or on the **form on the reverse of your current Amateur Radio address flysheet.** Please print carefully and clearly, use upper AND lower case.
- Separate forms for For Sale and Wanted items. Please include name, address STD telephone number and WIA membership number.
- Deceased estates Hamads will be published in full, even if the ad is not fully radio equipment.
- WIA policy recommends that the serial number of all equipment for sale should be included.
- QTHR means the address is correct in the current WIA Call Book.
- Ordinary Hamads from those who are deemed to be in general electronics retail and wholesale distributive trades should be certified as referring only to private articles not being re-sold for merchandising purposes.
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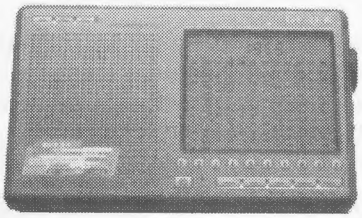

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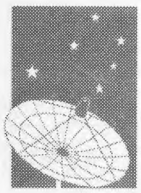

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***Chairman of the regional committee is in bold***

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## Broadcast details

| | | |
|---|---|---|
| VK1 | VK1WIA: | Sunday 0900 local on the Mt Ginini repeaters 146.950 and 438.050 MHz. The UHF repeater requires 123 Hz access tone and is linked to the Goulburn repeater. |
| VK2 | VK2WI: | Sunday 1000 and 1930 local, on 1.845, 3.595, 7.146, 10.125, 14.170, 28.320, 52.525, 145.6000, 147,000, 438.525 and 1273.500 MHz. Also 5.425 MHz USB in the morning..<br>Plus provincial relays both sessions and country relays in the morning via local repeaters. VK1WIA news is included in the morning. |
| VK3 | VK1WIA: | Sunday 10:30 am and 8 pm Local Time. Amateur Radio Victoria VK3BWI B/cast Network: 3.615, 7.158, 10.130,147.250 VK3RMM Mt Macedon, 146.700 VK3RML Mt Dandenong, 147.225 VK3RWG Mt Baw Baw, 438.075 VK3RMU Mt St Leonard. |
| VK4 | VK1WIA: | Sunday 0900 local via HF and major VHF/UHF repeaters. |
| VK5 | VK5WI: | Sunday 0900 local, on 1.843, 3.550, 7.140, 28.470, 53.100 AM, 146.900 (SE), 146.925 (CN), 147.000 and 439.975 |
| VK6 | VK6WIA: | Sunday 0900 local, on 1.865, 3.582, 7.075, 10.125, 14.116, 14.175, 21.185, 29.120, 50.150, 146.700 and 438.525 MHz. Country relays on 3.582 MHz and major repeaters.<br>Repeated Sunday, 1900 local, on 1.865, 3.565, 146.700 and 438.525 MHz. Country relays on major repeaters.<br>Also in 'Realaudio' format from the VK6WIA website. |
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| VK8 | | Sunday 0900 local, on 3.555, 7.050, 10.130 and 146.900 MHz. |

**Note that many clubs broadcast the WIA News via local VHF and UHF repeaters. Check the News section of the WIA website.**

# Chris Jones Award 2008

## awarded to Ken Fuller VK4KF

A surprised Ken Fuller VK4KF receiving the Chris Jones Award from WIA President Michael Owen VK3KAI.

*Only a year after it was first created and awarded, a second Chris Jones Award was presented at the WIA AGM Dinner in Broken Hill to Ken Fuller VK4KF.*

*Following the sudden death of Chris Jones, Ken volunteered to take over the role of Secretary on a temporary basis. Ken undertook the role to the full, and also took the lead in many tasks that needed to be completed to ensure a smooth transition to a new national organisation.*

Ken and his wife Pat following the Award presentation

***Further information on this and other awards made at the AGM can be found in the WIA Comment column in the June issue of AR.***

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